

# SUPPLEMENT.

## The Mining Journal,

### RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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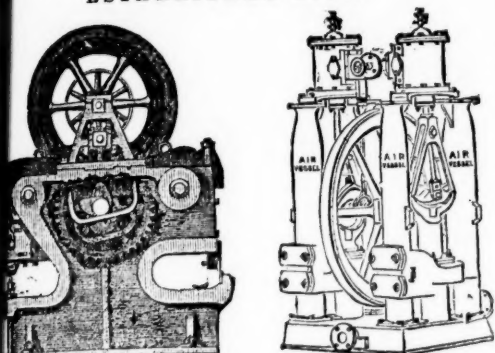
2173.—VOL. XLVII.

LONDON, SATURDAY, APRIL 14, 1877.

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Manufacturers of all kinds of Iron; Steel, Copper, and Galvanised Wire Ropes;  
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Ropes; Hauling Ropes; and Galvanised Signal Strand; Ship's Standing Rigging  
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Machinery; Steel Plough Ropes; Fencing Wire and Stand Lightning Conductors, &c.

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LOCOMOTIVES, AND OTHER ENGINES AND BOILERS.

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MCKENDRICK, BALL, AND CO.,

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PARIS,  
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,  
SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the  
Geographical Congress, Paris, 1875—M. Favre, Contractor, having  
exhibited the McKean Drill alone as the MODEL BORING MACHINE  
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland  
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

### THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-  
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,  
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-  
ing during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-  
nel, the McKean Rock Drill continued to work until the pres-  
sure was reduced to one-half atmosphere (7½ lbs.), showing  
almost the entire motive force to be available for the blow  
against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these  
Machines for the SEVERN TUNNEL; the LONDON AND  
NORTH-WESTERN RAILWAY for the FESTINIOG TUN-  
NEL; and the BRITISH GOVERNMENT for several Public  
Works. A considerable number of Mining Companies are now  
using them. Shafts and Galleries are driven at from three to  
six times the speed of hand labour, according to the size and  
number of machines employed, and with important saving in  
cost. The ratio of advantage over hand labour is greatest  
where the rock is hardest.

These Machines possess many advantages, which give them  
a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL  
USE THROUGHOUT THE WORLD FOR MINING, TUN-  
NELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the  
most portable—the most durable—the most compact—of the  
best mechanical device. They contain the fewest parts—have  
no weak parts—act without SHOCK upon any of the operat-  
ing parts—work with a lower pressure than any other Rock  
Drill—may be worked at a higher pressure than any other  
—may be run with safety to FIFTEEN HUNDRED STROKES  
PER MINUTE—do not require a mechanic to work them—are  
the smallest, shortest, and lightest of all machines—will give  
the longest feed without change of tool—work with long or  
short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or  
open work. Their working parts are best protected against  
grit and accidents. The various methods of mounting them  
are the most efficient.

N.B.—Correspondents should state particulars as to  
character of work in hand in writing us for information,  
on receipt of which a special definite answer, with  
reference to our full illustrated catalogue, will be sent.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,  
IRON, AND FLEXIBLE TUBING.

The McKean Drill may be seen in operation daily in London.

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Messrs. P. AND W. MACLELLAN, "CLUTHA IRONWORKS,"  
GLASGOW.

### The Warsop Rock Drill

(Involving an entirely new principle in Mechanical Boring)

Requires only 20 lbs. steam or air-pressure.

Has only two moving parts—thus ensuring freedom from de-  
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Is excessively light, and can be carried by one man, who can  
with the No. 1 size (weighing only 35 lbs.) drill 40 holes  
½ in. diameter and 1½ in. deep per minute, in the hardest Aber-  
deen granite for splitting purposes.

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HYDRAULIC AND GENERAL ENGINEERS.

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STEAM and HYDRAULIC WINDING and PUMPING ENGINES  
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AND

AIR COMPRESSORS.

DRIVING BED ROCK  
TUNNELS, SINKING  
SHAFTS, AND PERFORMING  
OPEN FIELD OPERATIONS,

IS THE

CHEAPEST, SIMPLEST,

STRONGEST, & MOST EFFECTIVE

DRILL IN THE WORLD.

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THE

### PATENT SELF-ACTING MINERAL DRESSING MACHINE COMPANY

(LIMITED).

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OFFICES,—GLASGOW: 150, ST. VINCENT STREET.

LONDON: 85, GRACECHURCH STREET, E.C.

IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWTH.

SUPPLIES MACHINES under the above Company's Patents for  
DRESSING all METALLIC ORES. Dressing-floors having these Machines pre-  
sent the following advantages:—

- 1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.
- 2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED  
BY DRESSING-FLOORS IS REQUIRED.
- 3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND  
FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.
- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN  
FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom  
and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines—  
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Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the  
Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esclair-  
mwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines,  
Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Brats-  
berg Copper Mines, Norway, and Mines in Italy, Germany, United States of  
America, and Australia, from all of whom certificates of the complete efficiency of  
the system can be had.

WASTE HEAPS, consisting of refuse chate and skimpings of a  
former washing, containing a mixture of lead, blende, and sulphur,  
DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-  
in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly  
profit on our Nanthead waste heaps amounted last year to £200, besides the ma-  
chinery being occupied for some months in dressing ore stuff from the mines. Of  
course, if it had been wholly engaged in dressing wastes our returns would have  
been greater; but it is giving us every satisfaction, and bringing the waste heaps  
into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines,  
Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much  
pleasure in stating that a full and superior set of your Ore Dressing Machinery has  
been at work at these mines for fully a month, and each day as the moving parts  
become smoother, and those in charge understand the working of the machinery  
better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,  
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,  
says—"Your machinery saves fully one-half on old wages, and vastly more on the  
wages we have now to pay. Over and above the saving in cost is the saving in ore,  
which is not much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The  
separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close  
the mechanical mixture, in such a way as no other machines can do."

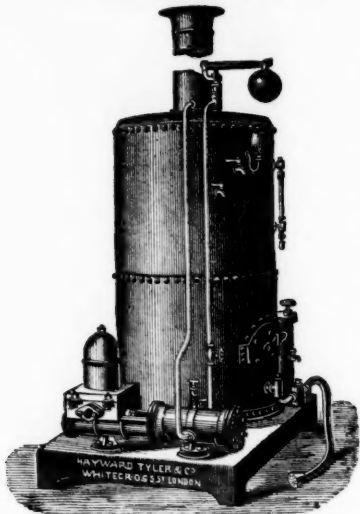
Mr. C. DODSWORTH says—"It is the very best for the purpose  
and will do for any kind of metallic ores—the very thing so long needed for dress-  
ing-floors."

Drawings, specifications, and estimates will be forwarded on application to—

GEORGE GREEN, M.E., ABERYSTWTH SOUTH WALES.



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1869—The Standard—

"The action is perfectly quiet."

1873—The Engineer—

"It is a fact that, although there is a great variety of Direct-acting Steam Pumps exhibited, none that we have noticed worked so quietly as those of Messrs. Hayward Tyler and Co."

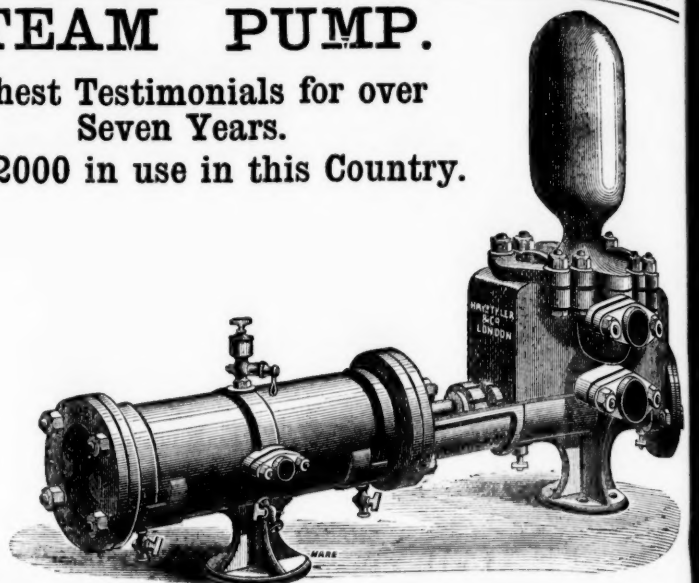
1873—Engineering—

"The 'Universal' (H. Tyler and Co.) Pump can certainly claim to be the simplest machine of its kind in the Exhibition."

1874—Griffiths' Iron Trade Exchange—

"Nothing in steam power so cheap and effectual as H. Tyler and Co.'s 'Universal' Steam Pump."

Highest Testimonials for over  
Seven Years.  
Over 2000 in use in this Country.



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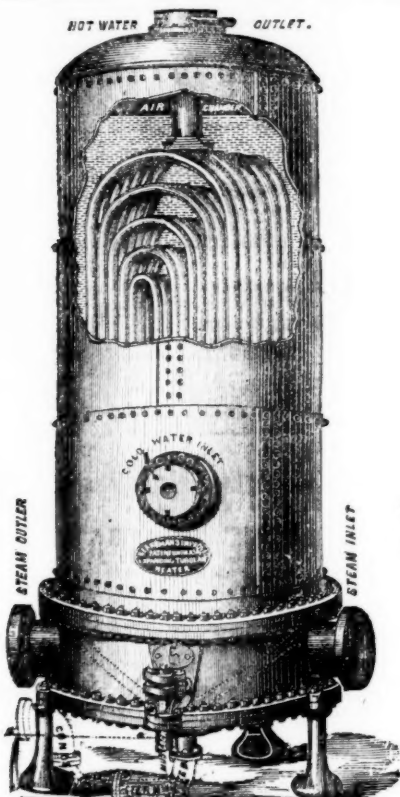
## BOLTS, NUTS, AND COACH SCREWS.

ARCHER AND HARPER,

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Manufacturers of all kinds of Shipbuilders', Engineers', Coach, Wagon, and Fish Bolts; Coach Screws; Railway Spikes and Brobs; Hot-pressed and Forged Nuts, Rivets, Washers, &c., &c.

SHIPBUILDERS' AND RAILWAY STORES' CONTRACTORS.



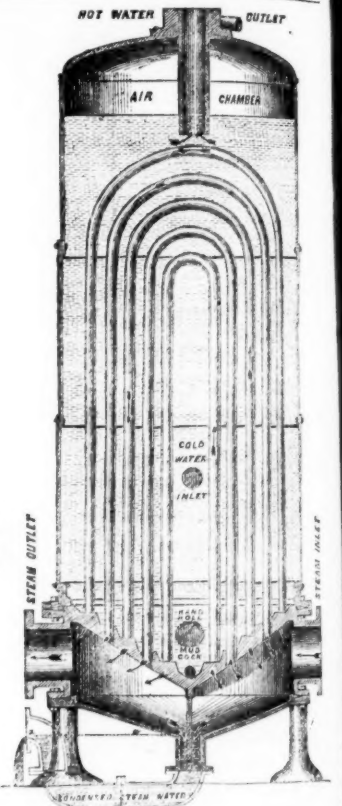
### IMPORTANT.

The outlet end of the condensed steam-water pipe, shown in dotted lines, may be continued to any distance from the Heater, so long as it discharges on a level with the Cone bottom, as shown at *a*, or it may go any depth into the ground, so as to form a syphon.  
In cases where the cold water pump is attached to the engine itself, a RELIEF VALVE should be placed on the feed pipes. When a separate donkey pump or injector is used, no valve is required.

## JOSEPH WRIGHT & CO.

(LIMITED),

## NEPTUNE FORGE, ENGINE AND BOILER WORKS, TIPTON, STAFFORDSHIRE,



Having purchased the Engineering Business lately carried on by R. BERRYMAN AND CO., at 23, Congreve-street, Birmingham, and 28, Wilson-street, Finsbury-square, London, have removed the whole to their Works at TIPTON, to which place ALL COMMUNICATIONS SHOULD IN FUTURE BE ADDRESSED, and where the BERRYMAN HEATER can be seen at work, and in every stage of manufacture.

Being the SOLE MAKERS and PATENTEES of these CELEBRATED COAL SAVERS and EXHAUST STEAM UTILISERS, and having remodelled and greatly improved them, adding largely to their HEATING SURFACE and WATER CAPACITY, J. W. and Co. have put down a special plant, which includes an entire new set of improved patterns, enabling them to offer these FEED WATER HEATERS to the public at

### GREATLY REDUCED PRICES.

This arrangement of BRASS TUBES of a great length giving an enormous HEATING SURFACE makes this HEATER not only the MOST POWERFUL ever invented, but its FIRST COST PER FOOT OF HEATING SURFACE IS LESS THAN HALF THAT OF ANY OTHER. It will condense the whole of the Exhaust Steam from the Engine if required, and entirely does away with the NOISE and BACK PRESSURE from exhaust pipes.

ALL THE TUBES ARE OF SPECIALLY PREPARED SOLID DRAWN BRASS AND COPPER; both ends are expanded into the bored holes of the same Tube Plate, METAL TO METAL, and every tube is free to expand and contract independent of each other. Leakage is impossible, as, when the tubes are once fixed, nothing short of cutting out will remove them. No scurf adheres to the tubes because of the difference of expansion between SCURF and BRASS. The inside of the Heater can be washed out by means of the mud cock and hand hole whilst at work.

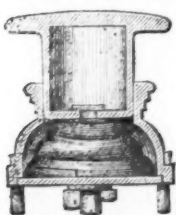
Only one pump or injector is required, and as the Heater is placed between the pump and the boiler, the water is forced, COLD, into it, and passes out at the top HOT into the boiler direct. Where the WATER WORKS PRESSURE is sufficient no pump or injector is needed.

The water being heated to BOILING POINT UNDER PRESSURE in the Heater, a saving of from 20 per cent. to 25 per cent. in fuel is effected; the disastrous results of grease in boilers are also avoided, the sewage and other loose matter in the water being deposited in the Heater, the acids are liberated there instead of in the boiler.

Every part can be lined with BRASS, COPPER, or LEAD, as may be required in special cases for heating water or any kind of liquor in large quantities for CHEMICAL WORKS, BATHS, WASH-HOUSES, AQUARIA, GREENHOUSES, BREWERIES, WOOL WASHING, DYE WORKS, TANNERIES, &c., &c.; they will also HEAT AIR FOR CUPOLAS AND BLAST FURNACES, and are now at work as INTERHEATERS for compound engines with direct steam from the boiler with a further saving of 15 per cent.

The New Price List, with detail information, is now ready, and will be sent on application, together with an Illustrated Catalogue, with references and testimonials from Firms using two HUNDRED AND THIRTY-THREE of these Heaters.

### THOMAS TURTON AND SONS,



MANUFACTURERS OF  
CAST STEEL for PUNCHES, TAPS, and DIES  
TURNING TOOLS, CHISELS, &c.  
CAST STEEL PISTON RODS, CRANK PINS, CON-  
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AXLES, SHAFTS and  
FORGINGS of EVERY DESCRIPTION.  
DOUBLESHEARSTEEL  
BLISTER STEEL, FILE MARKED  
SPRING STEEL, T. TURTON  
GERMAN STEEL, WM. GREAVES & SON  
Locomotive Engine, Railway Carriage and Wagon  
Springs and Buffers.

SHEAF WORKS AND SPRING WORKS, SHEFFIELD.

LONDON WAREHOUSE, 25, QUEEN STREET, CANNON STREET, CITY, E.C.  
Where the largest stock of steel, files, tools, &c., may be selected from.

### MANCHESTER WIRE WORK.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

### JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

Shipping Orders Executed with the Greatest Dispatch.





## Original Correspondence.

## COMMERCE IN THE SUPERIOR METALS FOR THE FIRST QUARTER OF 1877.

The first quarter of the current year has passed, and its commercial history is written so far with opinions as varied and conflicting as its very changeable and anxious political history. The salient points to notice in the general commercial review are—first, that our imports have greatly increased; second, that the exports of British and Irish produce (why are they not altogether classed as British produce?) have fallen off; and third, that our exports of foreign and colonial produce, metals of all kinds included, is about the same as last year, but probably a thought less. Some time ago the writer of these monthly and quarterly commercial reports in the *Mining Journal*, and the City editors of the *Mark Lane Express*, *Newcastle Chronicle*, *Morning Advertiser*, &c., urged upon the Board of Trade the duty of giving total values, and more accurately specified values in this last-named department; for a few months this was complied with and then ceased, the old loose estimates being given again. We have, however, with what painstaking care and pains we possessed arranged and computed these totals, and think we can say the export of colonial and foreign produce, metals and general commodities taken together, is about on an equal scale with that of the first quarter of last year. The value of the total trade of the country for the quarter was 158,000,000*l.*, an enormous trade, which no other country in the world possesses. Last year it was about 34 millions less, and the previous year about a quarter of a million less than in 1876. The advancing element is imports; the declining element British and Irish exports; but as people abroad "will give us nothing for nothing" the difference must be represented by profits, debts due to us for commercial advances, interest and drawings on foreign loans, amounts payable on account of foreign investments, the trade in ships and shipbuilding, and other things never accounted for in the Board of Trade Returns, and the revenue of land held in India, British America, Australia, South Africa, &c., by British original purchases. The income of the nation is not, on the whole, worse; but the productive interests are dull.

The value of imports and consumption for the quarter was 89,717,417*l.*, and for the same quarter last year about 7,000,000*l.* less, and the corresponding quarter the year before 8,755,000*l.* less. The month of March shows an import value of 35,229,598*l.*, about 2,300,000*l.* more than in the same month last year, and about 4,200,000*l.* more than the year before during that month. The exports of British and Irish produce for the quarter were valued at 47,200,755*l.*, during the first quarter of last year at 80,876,118*l.*, but in the corresponding time the year before at 53,060,239*l.* It is necessary to show the figures of the general trade if any proper estimate is to be made of the course of the trade in metals, for upon the former the latter depends very much. The tin trade we shall first notice as it is the most ancient of English metal dealings, and was for a long time the most prosperous. Carefully perusing the statistics of the metal merchants, they, we suppose naturally, differ from one another, and probably of necessity from those of the Board of Trade. The report of the latter is that the value of tin imported for the quarter was 279,648*l.*, compared with 362,215*l.* in the first quarter of 1876, and 461,513*l.* in the same quarter of 1875. This is a tremendous falling away in tin imports. During the month, however, the decline was small compared with the corresponding months of previous years. More Australian and less Straits tin has been received here, consequently large stocks of the latter have increased, ready to be poured in upon us when the present low price of tin gives place to higher quotations. There is a slight hardening just now in the market, but stocks are so heavy in Holland and the Straits that we cannot expect any gushing advance in rates. Of the tin we imported only 37,151*l.* in value was sent away again, about a third of the export of the opening quarter of 1875, and a fourth of that of 1876. The decline so far this year, compared with last, has principally been in the month of March, which was also the case in 1876.

English tin was exported to the value of 86,915*l.*, a falling off of about 11 per cent. from the first quarter of 1876, and a decline of 48,000*l.* (round numbers) from the first quarter of 1875. The export of the month was of the declared value of 37,500*l.*, last year it was 35,268*l.*, and in March, 1875, it was 42,000*l.* On the whole, this shows that the trade last month was much better than in the other months of the quarter. This export to Russia has improved, having been over double the amount of the first quarter of last year; but with Germany and France the falling away is signal, having been little more than half of last year's first quarter. The troubles in Turkey have not affected the export thither; it has remained almost stationary for several years. It is pleasing to observe that there is a great advance in this trade with the United States, which, considering the depressed state of business there, was hardly expected. The Great Union was a good customer for British tin. In the first quarter of 1875 there was a diminution, but still 44,664*l.* was received from us. The month of March that year began to exhibit a serious decline, the value having been only 9981*l.*, but that was much more than double the amount for the same month last year, but the third month of the first quarter of this year presents an advance to 12,977*l.* The first quarter of 1876 this commerce was much depressed, having been only 14,611*l.*, whereas last quarter it rose to 25,977*l.* It would appear that the alleged discovery of tin on the western slopes of the Rocky Mountains was unfounded, and upon those of the Cordilleras, at all events, greatly exaggerated. The Union took from us this year more than France and Germany together. There is reason to believe that both those countries supplied themselves from Holland.

Of copper ore we imported this quarter to the value of 156,550*l.*, against 117,185*l.* in the corresponding period last year, and four times as much as in that of 1875. Chili and the Cape of Good Hope did not supply half the amount. Of regulus, including precipitate, the value was 327,825*l.*, against 281,354*l.* the first quarter of 1876, but less than cut-mary. The imports were very active last month, being of the declared value of 152,596*l.*, nearly as much as those of January and February together. Unwrought or part wrought copper was imported of the declared value of 771,685*l.*, 81,000*l.* more than in the same space of time last year, but nearly 250,000*l.* less than in the year before; nearly the whole was brought from Chili and Australia. The increase of this import in March over March of last year was considerable, again showing increased activity in the import metal trade during last month. Of these copper imports there was exported only unwrought or part wrought to the large value of 364,525*l.*, against 299,663*l.* the first quarter of last year, and over 12,000*l.* less than that of the year before in the same space. This "re-export" was very active last month, being nearly twice as much as in the corresponding month last year. The total exports of British copper for the quarter were of the declared value of 813,678*l.*, as compared with 714,615*l.* in the same quarter last year, and 745,613*l.* the year before, so that notwithstanding all we have heard, and to some extent felt, of the depression of the metal trade copper shows so far a decided improvement, which was most signal last month, when the value was 331,476*l.*, 56,000*l.* more than in March, 1876. Of this aggregate value unwrought in ingots, cakes, or slabs answers for 223,822*l.*, nearly the very same amount as last year during the corresponding period, so that the improvement has chiefly been in wrought or manufactured, and in mixed or yellow metal sheeting. The former figures for 257,981*l.*, and the latter for 331,875*l.*, the export of which for March was exceedingly large, being 149,343*l.*

Our best customer for copper is India, to which was exported 124,000*l.* worth of manufactured or wrought, and 32,500*l.* worth in ingots, cakes, and slabs. This is a vast improvement upon last year, and but for the famine the advance would have been still greater. Germany is our next best customer, except France, having bought from us 35,158*l.* worth of unwrought copper, and 12,963*l.* of manufactured. France imported 91,255*l.* in value of unwrought copper, but scarcely any manufactured, as she now manufactures for herself. This trade with Holland and Belgium is signally declining for the same reason. Turkey and Egypt are good customers; with the

latter this commerce has been very steady for years, but with the former it is declining, in consequence of the unquiet state of the empire.

Lead mining is just now more popular in Great Britain than mining for any other metal; and well it may be, for the imports are rapidly increasing, not, it appears from the Board of Trade Returns, for the purpose of re-export, but for consumption here, the demand has so much increased. The value of the imports of pig and sheet for the quarter was 546,919*l.*, nearly 122,000*l.* more than in the first quarter of last year. This trade in March was far more brisk than in the other months of the quarter, having amounted in value to 204,581*l.*, against 153,785*l.* in March last year. We believe that some small portion of this was re-shipped, but it must have been very small, as the registry of the Custom House takes no notice of it. The export of British lead appears to be on the increase, the value for the quarter was 205,366*l.*, it was a trifle less last year and 52,000*l.* less the year before. As in the case of copper, lead exports were proportionately more enterprising last month, comparing it with the previous months of the quarter. The exports consisted of pig, rolled, sheet, piping, and tubing. Our best customer, as usual, was China, and much of it was sent to Hong Kong, and English merchants at the five ports for tea packing. The value was 127,543*l.*, very much more than half of our whole exports. This business with China goes on rapidly augmenting, last year the value was 115,050*l.*, and in the year before 64,258*l.*; so far as the quarter shows the trade has increased more than threefold in three years. British India has been a good customer. The export was 16,327*l.*, one-third more than last year, and nearly one-half more than the year before. Australia also imports fairly, 12,584*l.* are the figures for the quarter, one-fifth more than last year. Our exports to Russia have declined, but they are so irregular that it would be difficult to predicate anything concerning them. It is, however, cheering to observe that there is a reviving demand in the United States. In the first quarter of 1875 it was only worth 11*l.* In 1876 it rose to 7558*l.*, and in 1877 to 8226*l.* With France it is diminishing in an equal ratio.

Zinc was imported, crude and in cakes, to the extent in money of 122,239*l.*, against 144,580*l.* last year. Manufactures of zinc were imported to the value of 74,067*l.*, a little more last year, and 136,240*l.* the year before. The imports of this metal decline, as its use does not extend in this country at all in the same degree as on the Continent. Whatever foreign spelter was re-shipped the Custom House officials have not recorded. The export of British spelter was small—to the value only of 31,336*l.*, but this is 14 per cent. more than in 1876, and 48 per cent. more than in 1875. Pyrites of iron, copper, or sulphur were received from abroad to the value of 451,344*l.*, against 388,202*l.* in the opening quarter of last year. The quicksilver imports were valued at 192,178*l.*—an increase of 21,000*l.* upon last year, but 130*l.* less than last year. Of this 68,356*l.* was re-shipped—a little less than last year, and a little more than the year before.

On the whole, our trading in the superior metals has been satisfactory, and encourages us to look forward to the spring for much better employment for our miners of tin, lead, copper, and spelter, and better prospects for investors in mining enterprise. We wish we could write as favourably of iron, the decline in which still progresses, but the details of this interest, its prospects, and the grounds assignable for them would require a long and separate article.

## AUSTRALIAN GOLD COMPANIES.

SIR.—My attention has only this day been called to two letters under the above heading, coupled with my own name, which appeared in the *Journal* of last week and the week before. Had I seen the first of these communications before your last issue I should certainly not have allowed the week to go by without a reply.

With regard to the INVESTMENT COMPANY, those who are concerned to know are aware that it was formed in 1871 to purchase shares in some of the mines, mainly dividend paying, of Australia and New Zealand. At that time there was no telegraphic communication with those colonies, so that, not knowing what might happen in the long interval, we were bound to leave a considerable margin of discretion in the agent's hands. It happened, unfortunately, when the money arrived out there for investment there was a wild mining mania, such as had never occurred before, and I think hardly ever likely to occur again. The prices of all stocks were abnormally raised in value, and some half dozen mines, upon which I chiefly relied for dividends, were unfortunately amongst those more especially run up in the market, and consequently no investments were made in them. Now, I wish to call your correspondents' attention to the following facts. The news of our first purchases came to hand in January, 1872, and finding that these mines were left out, I wrote thus on the 26th of that month to the agent in Melbourne:—"I very much regret that you did not purchase" so and so (mentioning these mines), "even at the enhanced price they are worth the money, and they are good stable undertakings." The agent writes from Melbourne on the 3rd or 4th of February, only a few days after, our letters crossing on the way: "I will use my best judgment, but" so and so, &c. (mentioning these same mines), "must all, I think, be left out." If your correspondents will refer to the circular sent to all shareholders, dated July 31, 1872, they will find the mines there indicated and commented upon; and in No. 4 of "The Dividend Companies Express," published by me on October 19, 1876 they will find the dividends for five out of the six given in detail month by month up to that date.

*Litera scripta manet.* I have here given references which cannot be got over. Now, your correspondents may reckon for themselves, and they will find that even at the enhanced prices these mines would have given us an annual return of 20 to 25 per cent., and at the normal prices 30 to 40 per cent. The colony of Victoria is now passing through a period of great mining depression; the gross mining dividends for the month by last mail, instead of the usual 50,000*l.* to 70,000*l.*, being only 15,000*l.*, the lowest aggregate for, I should say, at least 10 years. Notwithstanding this, two out of the six mines I speak of are found in the list of dividends; the month before there were five, and throughout the whole five years it has rarely ever happened any month that three out of the number have not paid dividends, almost as frequently four, and nearly as often five. What was attempted was only part of the plan of operations. It was intended that the whole of the capital should be called up; our investments increased in these same undertakings until more than one moiety would have belonged to this company, and then my own would have grown into, perhaps it is not too much to say, one of if not the most successful mining office ever yet opened in England. But "Man proposes, God disposes." Had my judgment, unfortunately, not been set on one side the Mariners and St. Arnolds, &c., would never have languished for want of the necessary capital, the only present cause of failure. The success of my clients would have been my own, just as their loss is, a *fortiori* and unmistakably, not less mine also. Of course, we all get angry to some extent over our losses. At least, I do.

I should like here to correct one other false impression set forth in these letters. The three directors for the year ending Sept. 30, 1875, received 75*l.* between them, and 75*l.* in shares, the year before nothing whatever; 12*l.* 10*s.* per annum for each one is certainly not an amount on which to found a charge of excessive remuneration. But as regards the current period I may say no cheque has been drawn since November last, and no cheque whatever has been drawn for directors' fees since the last shareholders' meeting, nor will be before the next shareholders' meeting, which will take place in the course of a week or two, as soon as papers I am now waiting for arrive. As for sending out the shares of this company to be sold by auction for what they would fetch, it would, in my opinion, simply mean selling for less than their value those shares which are giving good returns, sacrificing the rest which do not happen to pay at the moment, without any fair equivalent, and without any tangible benefit whatever to shareholders. Even withal there are two or three alone of the many investments we now hold which, if the mines should again make returns equal to what has been done before, would each be capable of giving 10 per cent. upon the whole of our investments, and it is by no means improbable they may yet again be quite as successful. As an instance in point, from one

of our investments, for which we gave about 500*l.*, we have received nearly 1000*l.* in dividends, and the shares are worth even now at least 750*l.* But it is not so very long ago that one or two of the shareholders in that company allowed and intended their interests to be forfeited rather than pay up a trumpery call of a shilling or so per share. Unfortunately, there was some irregularity in the forfeiture; the company became a success, the defaulting shareholders claimed to be reinstated, and actually recovered last year on an appeal to the Privy Council in England nearly 20,000*l.*

Now, for the ST. ARNAUD MINE. I think you will admit it is hardly possible to conceive a more righteous undertaking. The vendors were offered in the colony for this same property 6000*l.* in cash, and 4000*l.* fully paid shares, out of 20,000*l.*, the balance of 16,000*l.* being made up of contributing shares. The St. Arnaud Company, however, gave nothing but shares for the property, and I am in a position to state that not a single vendor's share has ever been sold. The directors have practically not received one shilling from the company, nor has the secretary. But, on the contrary, four of the directors and myself subscribed 2672*l.* out of the original capital, and of the last 5000*l.* raised, 12 months ago, a further sum of over 1500*l.*, making nearly 4200*l.* in all. Whoever your correspondent may be, without knowing his name, you may take it for granted my own *bona fide* subscription to the company is at the least five times the amount of his. Here then we have a company held up to reprobation from which neither vendors, directors, nor secretary have taken one penny, but, on the other hand, have themselves provided one-fifth of the subscribed capital. And to show that the mine is not exactly a myth, I enclose a statement of yields furnished to all shareholders alike, and from which you will see that work only ceased on Nov. 1, 1876, and the last previous crushing—on Oct. 16—was one of 18 tons, for the excellent return of 21 ozs. 17 dwts. 15 grs. of gold. But we must perforce come at last to the limit of the strength of the willing horse. Bricks are not made without straw.

As to the GOLDEN CROWN (L. and T. R.), the vendor sold to our company less than half his interest, and could not be prevailed upon to sell more. It is to be remembered that applications for double the amount of capital required by our company were sent in. The vendor holds now every fraction of the interest he then refused to sell, and which is more than our company holds. So much for the vendor. As for myself, I was from the first almost the largest shareholder in the company, *bona fide* cash payments; and what is more, nearly 12 months later on I bought a further considerable interest in the parent company at nearly the same figure our company gave. So that, in fact, at this present moment I have a larger amount invested in it than any one of my clients. From first to last I have never attempted to part with a share. This mine paid 130,000*l.* in about two years, and at the time of our purchase no change had come. The returns, had they continued, would have given us 40 per cent. upon our purchase. But, unfortunately also in this case, the rich shoot of gold took a curve northwards, and passed the boundary into the Caledonian Mine—that company paying the largest amount of dividends on record ever paid by any mine—half a million sterling in six months. It might have fallen to our share, naturally it should have done so, but it did not. The Caledonian Mine, however, has done nothing since.

The English issue of the IMPERIAL CROWN was not brought out by me at all, but by the New Zealand Loan and Mercantile Agency Company (Limited), and quite as a favour, for double the whole amount of the issue could have been easily placed, I had for a few short hours some 500 shares placed at my disposal at par, which were allotted to those who applied to me for them; and on this allotment I neither asked for nor took commission from either side. Afterwards, when the demand set in for these shares, I offered 2*l.* 10*s.*, and ultimately 3*l.* 10*s.* premium; and, singularly enough, when I could have sold more at 3*l.* 10*s.* I could not get them. The mine has a large area, adjoins the Golden Crown, and the ground covers not only the continuation of the Golden Crown and Caledonian lodes, but of other parallel lodes also, which have yielded rich gold in some of the neighbouring claims. As regards the opinion held locally of this property, it is sufficient to state that after the capital raised was expended—and, by the way, every farthing raised was legitimately spent in mining operations—the Provincial Government advanced 50,000*l.*, without interest, to enable them to continue working. Upon the success of this mine mainly depends the future of the Golden Crown and most of the other Thames River ventures. They are simply driving at a depth. Meanwhile they have no story to tell. As soon as they have we shall hear speedily enough, not to mention that the papers will all be full of it. Mines that are not doing well are naturally reticent, the slightest success, however, sets them speaking of it.

Without unduly lengthening my letter, so that it will not be read, and I am afraid I have already reached the very verge of that point, I think I have given facts enough, which cannot be gainsaid, sufficient to convince not only shareholders but the reasoning outside public of the legitimate foundation of the companies named. But, as I said in a former letter, although splendid profits are unquestionably to be made by mining, such as can be gained from no other class of undertaking, at the same time the fact should never be lost sight of that mining is after all mining, and the most that can be done for an investor is to protect him as far as possible from incurring more than a fair mining risk. But my own experience is that in honest undertakings success is more frequently missed through failure to give that proper support without which, under similar circumstances, no commercial undertaking—even the soundest—could ever hope to succeed. Mining undertakings require necessarily more consideration and greater margin for mistakes and miscalculations than any other, but, as a rule, they get infinitely less.

Unfortunately, we have all too much experience of the fact that a large number of the shareholders who first join afterwards shrink their share of the responsibility; thus, on those who do accept it, quadrupling the burden which, fairly distributed, would otherwise have been easy enough to bear. In this way, from the holding back of some, even the soundest and most honest undertaking has no chance, and may be converted into what, as far as actual results matter, might have been the wildest of wild-cat schemes imaginable. *Qui se excuse, s'accuse?* It is hardly necessary, therefore, to say that I never at any time sold an interest in a mine which I either knew or supposed to be worthless, or even where I felt hope was departing. In fact, I should as soon think of knowingly passing a bad half-sovereign as of advising a client to buy a share in any mine I did not consider at the time a sound undertaking, and honestly worth the money. But in mining especially the saying is only too true, that mortals, however much they may endeavour to deserve it, cannot command success.

THOMAS DICKER.

April 4.

## ROCK-BORING MACHINERY.

SIR.—I am a constant subscriber and reader of the *Journal*, and one who has always felt a deep interest in mining, and especially in the use of machinery economising the development and treatment of the ore staff coming from the mines. Machinery for the latter purpose has made rapid strides during the last few years—so much so that staff a year or two ago that would not pay the dressing cost will now by the aid of machinery not only pay for breaking, hauling, and dressing, but will leave a profit to the company. But machinery for the more speedy and economically opening out the underground workings has not kept pace with that for dressing. Many patents have been secured for rock-borers, and everyone advocates his own as the best. No doubt they have all their merits; but from all the information published in the *Journal* and elsewhere I could not find that either has been a success, until looking over the *Journal* of Nov. 4, p. 1219, I saw a description of one seen at work at the Minera Mines, North Wales, which appears to be a success. Had I not known the writer I should be disposed to treat the article as an advertisement, but being personally acquainted with him for many years, and knowing him to be truthful, and not given to making random statements, I am prepared to believe every word he has written on the subject.

Cornishmen, as a rule, are apt to feel a prejudice against any new inventions that have a tendency to alter the usual system of conducting mines. This is to be regretted, inasmuch as many mines



now abandoned would undoubtedly by the introduction of rock-boring machines and improved dressing appliances be still at work, and have become so extended as to employ a large number of hands, and giving a profit to the shareholders—thus directly or indirectly benefiting a whole community. I feel confident that the time is not far distant when rock-boring machinery and improved blasting compounds will become the order of the day in the development of mines. Why should not machinery be as successful in this as in every other branch of trade?

Not having had any experience in rock-boring machinery I am not in a position to give an opinion, but should be glad if others who have had any experience would give the information to others for the benefit of mining. In blasting compounds I am able to give an opinion, and have found lithofracteur answers the best for hard wet ground. Our miners will not use anything else, and I can speak from experience that when compared to powder it effects a saving of from 30 to 40 per cent. in the price of sinking and driving.

ROBERT SANDERS, Manager.

Burra Burra Mine, South Australia, Feb. 24.

P.S.—I should be glad to know the horse-power required at the air compressor to give a certain horse-power to each rock-borer—i.e., the loss of power between the compressor and borers. J. S.

#### NORTHAMPTONSHIRE IRON ORE.

SIR,—I have read the notice of "Ironmaster's" letter on this subject in last Saturday's Journal. The ore, a hydrated hematite, is described as containing a large portion of silica. If the silica is in a free state, the difference between its specific gravity 2.5, and hematite ore 5.2, admits of its separation in the Pneumatic Concentrator. Hydrated hematite would probably be somewhat less than 5.2, but I believe margin enough would remain for an easy and effective separation. In three or four weeks I expect to have a machine at work at Swansea on an ore of hornblende, specific gravity 2.9, blends 3.9 to 4.0, galena 7.5, and I could, no doubt, give "Ironmaster" an opportunity to have his ore tried.

From the analyses I have seen of the Northamptonshire iron ore, I should think it could be brought to a degree of purity which would greatly enhance its value, and might possibly make it equal to imported Spanish ones. The quantity raised, too, is very large, exceeding 1½ million tons yearly.

As you have been kind enough in previous instances to publish for me letters on the Concentrator, I take the liberty of again resorting to your kind services to bring to the knowledge of "Ironmaster" the mechanical means at command for improving the Northamptonshire ores.—April 10.

B. W. HART.

#### LANZI MINES, AND NEW PATENT DRY ORE CONCENTRATOR.

SIR,—In the *Mining Journal* of December, 1874, you gave me an account of Krom's Patent Dry Ore Separator, which attracted the notice of the directors of the Lanzi Lead and Zinc Ore Mines, who, after much consideration as to obtaining the best system of ore separation, determined to thoroughly try the system of Krom's invention; and, to that end, they in the first place engaged the services of Professor Y. G. Bell, a gentleman who has been accustomed to analyse for smelters. About 1 cwt. of Lanzi ore was sent over to America, to be treated by the inventor's machine. The separated lead, zinc ore, and gangue has been duly returned to the directors, and Mr. Bell has fully tested and reported on the results. He concludes his report by saying, "Such statements need only the verification of actual working on the large scale to revolutionise the mining world, and I confidently look forward to the projected trial at Swansea to bear out the conclusions I have drawn from the results of the present experiment."

The Lanzi Company have bought a machine in America. An expert will come over with it for the purpose of having it properly fixed, and seeing that it has fair play; the patentee would not allow a machine to come to this country unless on these conditions. About 20 tons of the Lanzi ores will be delivered at Swansea in a few days. The machinery and the expert are expected at the end of this month, they are only awaiting a telegram before starting. The trial has been arranged to take place at Messrs. Dilwyn and Co.'s works, Swansea. I believe that any respectable person interested in minerals will have the opportunity, on application, of witnessing this highly important trial. The machine will be in operation at Swansea for about 10 to 14 days, after that it will be sent to the Lanzi Mines.

EXPECTANT.

#### MINING IN NEWFOUNDLAND.

SIR,—In the supplement to the *Mining Journal* of January 13 appears a letter signed "Terra Nova," and entitled "Mining in Newfoundland," in which the writer shows very clearly the advantages likely to accrue to British capitalists who may embark in mining in this country. As you seem to invite correspondence for the information of your numerous readers I purpose laying before you—very shortly—what has been done in mining amongst us, and to show what position Newfoundland is sure to take in the mining world in the immediate future. Although Newfoundland is one of the oldest colonies of the British Crown, and the nearest of her North American possessions, and possessing greater natural resources than any of the adjoining provinces, she yet remains to the people of Great Britain an unknown land. There were many causes to bring about and foster this state of affairs. Most notably the policy of the Mother Country in prohibiting settlements, and in reserving our immense fishery resources as a nursery to train men for the Royal Navy. Of late years this injustice has ceased. Now the whole country is thrown open for settlement, and as a result our people are turning their attention to agriculture and mining as future profitable fields of labour. Up to the present time, as your correspondent observes, there are but two mines in operation, one of those—Betts Cove—being opened within the past two years; the other has been in successful operation for about ten years.

Your correspondent must be slightly in error when he states that the value of the output from Betts Cove Mine for the last three months of 1876 was only 16,000. Although not having the precise figures before me, I should estimate the yield for that time to be fully 40,000. Of this, however, I am certain, that during the shipping season of 1876 this company exported over 18,000 tons copper ore, which, if taken at the low estimate of 5s. per ton, would give a gross value of 90,000. For this one mine alone.

The proprietors of the Union Mine, Tilt Cove, have never worked their mine vigorously, which accounts for the smaller output as compared with Betts Cove, but it remains, perhaps, the finest copper bearing claim yet discovered. During the past year or two several of our influential people have embarked to a slight extent in copper mining, resulting, I am happy to say, in the discovery of large deposits of mineral in various places. The most successful so far has been the two companies in South West Arm, and the Rouge Beach Mining Company, all in Green Bay. Crews have been at work all this winter in developing these properties. The last reports were of the most encouraging nature. Many more are likely soon to turn their attention to mining matters, encouraged by the success attending those mines which have been lately discovered. Now is the time for British capitalists to come amongst us, whilst the business is in its infancy, and while land can be had on such reasonable terms from the Government as at the present time. Arrangements can be made with parties now in possession to work their properties who have not sufficient capital of their own to conduct mining operations successfully, either by paying them a royalty on each ton exported, or by giving them a certain share of the net profits. I know of many who would make arrangements such as these.

I believe Newfoundland is yet to become one of the greatest mineral-producing countries in the world, as we have immense tracts of country where, copper, lead, coal, and iron have been found, not to mention our beds of marble and gypsum. One peculiarity in Newfoundland copper mining is this—that on all our mining sets the seams have been worked from the very surface. Union Mine, Tilt Cove, for instance, produces sufficient ore each day to pay current expenses, and all the deposits so far known are near the surface, and seemingly inexhaustible. Contrast this with the uncertainty of mining in Cornwall, where it is necessary in some instances

to sink (say) 300 fathoms, and then, perhaps, complete failure is the result; here, for a comparatively insignificant sum, our copper claims may be tested, and either worked or abandoned as may appear proper. In deep mining we have no experience, and it may be when we are obliged to sink deep down our success will be more eminent than at present.

In conclusion, I would state that from the reports of our geological surveyor, Mr. Alexander Murray, F.G.S., we find that there are about 400 square miles of land in the Green Bay district alone in which copper ore may, and will, be found.

Capital and energy, combined with scientific skill, is now wanted to develop these vast regions of mineral wealth, and I trust, in common with my countrymen, that the same will be soon forthcoming from amongst the great mining centres of England and Scotland.

St. John's, Newfoundland, March 26.

J. B.

#### ROMAN GRAVELS.

SIR,—The letter in last week's *Journal* from the secretary of this mine, with reference to the loss sustained by the failure of the Bury Port Smelting Company, induces me to draw attention to what I consider an unsatisfactory feature in the management, which those who were induced to purchase shares at the high prices ruling some years ago have good cause to complain of.

In 1873-74 the company paid quarterly dividends of 8s. 6d. per share, having raised the dividend from 6s. to that sum, and better results promised in future; the manager and directors positively stating that the returns would be increased to 300 tons per month in August, 1874. In 1874-75 the rate of dividend was continued at 8s. 6d. per share, but was paid only every four months. At the meeting, however, in 1875 the manager continued his sanguine assurances that the mine was now in a more prosperous condition. In 1875-76 the company took 13 months to pay three dividends of 8s. 6d. per share, although the report was as usual very glowing, the manager asserting the mine was only just beginning to be developed. In 1876-77 the company can only show two dividends of 8s. 6d. per share; the dividend that should have been paid in February being only declared in March, and now deferred until May 28, in consequence of the above failure—seven months between the two dividends. I am aware that the sinking of the new south engine-shaft, wet or dry weather, frosts, and now failures, have been given as the reasons why dividends have not been more regularly declared, but my strongest objection is to increasing the dividend to 8s. 6d. quarterly, when the directors must have known they could not continue it. I also object to the irregularity in paying the dividends, sometimes four, five, and seven months, instead of continuing to declare them quarterly, the amount to be regulated by the profits; also to the directors pretending to sell a certain quantity of lead ore monthly, when it is sometimes five, six, or eight weeks between the sales. I contend that the sales ought to take place every four weeks, and the dividends declared quarterly, whatever the quantity or amount may be. This would be a more honest system of working, and would enable investors to judge more correctly of the value of the shares; besides, it is the method adopted by the other first class mines, such as the Van, Minera, &c. If the mine is really falling off let us know the worst at once, instead of this continued finessing.

I find on looking to the balance-sheets that the net profits for the last three years of the published statements were as follows: For 1873-4, 23,559.7s. 4d.; 1874-5, 14,517.10s. 8d.; 1875-6, 16,397.6s. 3d.; and there was transferred to capital account the following sums (ostensibly out of the above profits) to meet cost of sinking new engine-shaft: In 1873-4, 3000l.; 1874-5, 1500l.; 1875-6, 1600l.; although the dividends declared in 1874-75 were nearly 1000l. in excess of the whole net profits of that year, the exact sum divided (including income tax) being 15,427.10s. Where, then, is the promised increase of the returns? We appear, instead, to be going rapidly back, and I fear the accounts to be presented to the approaching meeting will still indicate a falling off in the returns.

A SHAREHOLDER OF SOME YEARS' STANDING.

#### CAPTAIN TREGAY, AND PEDN-AN-DREA MINE.

SIR,—Capt. Tregay says that I am an extraordinary correspondent. From his recent epistles your readers will no doubt easily believe that anyone who deals in facts will appear strange to Capt. Tregay, for he evidently views such things with contempt. He also says that I object "to being referred to as an anonymous writer, object to having his (my) questions unanswered, and object to the answers given." Everyone who has read the correspondence will see at once that the only truth in these assertions is in the second one, for Capt. Tregay has carefully avoided answering any of my questions, and has attempted to distract attention from the real points by harping on the worn out string of anonymous writer, which is the usual course of those to whom truth is inconvenient. He further says that I must be content with such answers as he may choose to give, but he is mistaken in this also, and he may find others of the same mind. He states that the answer he gave to question No. 3 has been altered by you, and that what he wrote was not anything so conciliatory. Of course not. Capt. Tregay seems incompetent to give a straightforward reply.

But now to his reference to the figures and accounts. Captain Tregay says, "W. X. thinks himself very clever at figures no doubt, having given us extracts from the balance-sheet issued in June, 1875, and from that issued March, 1876. But where is the sheet which gives the accounts between these two?" The first-named showed the accounts down to May 14, 1875, and the latter from January, 1876. I suppose he knows there must be some account somewhere between these two periods. Had he been able to have given you the sheet made up in February the truth of my remark would have been at once apparent. Now, Capt. Tregay ought to know very well that no balance-sheet was issued in February, 1876, and to show how reckless he is in his statements, if the March balance-sheet was on y for the period he names—from January—the loss for that short time would be 11,000l., for such (as stated in my last) was the debit balance shown in the latter balance-sheet. Capt. Tregay must be well aware that the March balance-sheet included the receipts and payments from May 14, 1875, to February 21, 1876 (as I said), and I repeat that the total loss in working the mine during the final 14½ months of the late company was 16,525l., and the calls made in the same time amounted to 15,820l. So much for the correctness of Capt. Tregay's assertion that some "sheet" was omitted which would show that this loss was for a "much longer period."

I said that I was sceptical as to the rumoured profits now being made, and what I observe in last week's *Mining Journal* tends to make me still more doubtful. In his report of March 10, 1876, to the shareholders of the late company, Captain Tregay wrote—"We have reduced the monthly cost very considerably, and hope to do a little more in that direction," out, notwithstanding this very considerable reduction actually made, and the promised further diminution, the average monthly cost, of four weeks each, including merchants' bills and dues, was for the 12 months ending Aug. 4, 1876, as much as about 1850l., the average return of tin being rather over 20 tons, of a value of (say) 3s. per ton above present price. In last week's *Journal* it is officially stated that 40 tons 16 cwt. of tin had been sold for March for 1784.5s. 3d., so that even if Capt. Tregay can now, under his own proprietorship, dress nearly double the quantity of tin at the same total expense that he managed to do only about half the quantity for the late company, it is difficult to see where the rumoured profits are.

Perhaps the conjectures I ventured to express may be about correct—that the mine is not being worked on the scale it was, and that they are now "picking the eyes out," and thus securing some temporary profit; or some future arrangements may be contemplated, which would make it inconvenient to divulge the facts of the case.

As to whether any dead work was done at the expense of the late company, after it was known the property was to be sold, but which work could be of no benefit except to the incoming purchasers, I will at present confine myself to noting that Capt. Tregay persists in declining to answer the question, and leave it to your readers, and those who may be interested, to judge whether Capt. Tregay rightly estimates his own position and duty when he considers it "Sheer

impudence to assume the right of questioning me (him) on the matter," and that he has "nothing to answer for to the late company."

I will merely add that Capt. Tregay has given no satisfactory explanation as to how it happens that, after many years of working the mine under his management, with a very heavy loss (about 100,000l.), up to the end of July last, when the late company transferred the property, he is able (as reported) within a few months afterwards, under his own proprietorship, to increase the returns and make what is called good profits, even with a lower price of tin; in fact, to use his own words, how, immediately after giving above results from the mines to the late shareholders, he is "able to work them without their help since"—April 10.

W. X.

#### CAPT. TREGAY, AND PEDN-AN-DREA MINES.

SIR,—In my last on this subject, for "during the period under discussion we had upwards of 40 men employed, using much timber and a steam-engine, putting down a new engine-shaft, all of which would be likely to cost some money," read "40 men extra," &c.

The above work was stopped early in 1876, as soon as the company had begun to consider the question of discontinuing to work the mines.

These mines were wrought extensively in the last century, and paid good profits then; idle, except at short intervals during the first half of the present century they, nevertheless, always produced large quantities of tin whenever worked. Under the late company they produced 357,895l. worth of mineral, and are only now about the depth where many of the great tin mines in the neighbourhood commence their extraordinary productiveness. The production hitherto, large as it may appear, is, however, only a tithe of what Pedn-an-drea Mines are destined to give, for a glance at the geological position, at the rocks, and at the lodes here will convince any man who can read correctly such phenomena that the value of the production of these mines will have to be counted in millions, and that they are destined to provide profitable employment for many succeeding generations.

W. TARNER.

#### PARYS MOUNTAIN MINES.

SIR,—Here is the analysis of the bluestone mentioned in my letter of last week, and there is no reason to doubt but that the piece I broke off in the mine represents a fair sample:—

Lead	15.90
Copper	3.58
Iron	16.45
Antimony	0.10
Arsenic	0.13
Zinc	26.18
Sulphur	32.65
Soluble silicates	0.82
Earthy matrix	3.65
Oxygen	0.50
Gold	0.001
Silver	0.012
Loss	0.27 = 1000

This gives one-third of an ounce of gold and nearly 4 oz. of silver to the ton weight of rock.

CALANITZ.

#### NEW CONSOLS MINE.

SIR,—A "Shareholder," in last week's *Journal*, calls me—(I presume he means me—Capt. Pryor's champion. I beg to inform him that I sustain no such position; I merely write what I know to be true, but, so far from being under Capt. Pryor's inspiration, he does not know who I am, unless you, Mr. Editor, have informed him, which I do not suppose. He knows me, but not as the writer of the letter. I am not aware that Capt. Pryor ever performed or wanted any "bolstering" to keep his position, and he has done nothing which requires an apology. The mine broker who informed "Shareholder" about the "dozen mines" cannot allege any fault against Capt. Pryor. The mines he has managed are not mines that are extinct or were badly managed. St. Just Annagran was suspended because tin dropped to an unremunerative price and the supply of funds stopped, but the works have been resumed by another party. East Basset did not cease from any cause but want of funds and the failure of the purser. It will be worked again immediately after the winding up has been completed—at least, that is probable. It is a good mine. North Treaskerby is not abandoned, nor is it likely to be so; the bankrupt shareholder held too large an interest in the mine. The materials and engines are on the mine, nearly ready for re-starting. New Towan and Hlogan Mines are in a nearly similar position. Phoenix Lead Mine will probably be revived shortly; the machinery is there ready for motion. The amount stated to have been expended in the several mines is, I think, exaggerated, but in New Consols a large amount has been expended in opposition, I believe, to Capt. Pryor's wishes. I know Cornwall and its people better than "A Shareholder," and I know Capt. Pryor is thought well of there for his sterling integrity, truthfulness, and intelligence, and he is well able, I doubt not, to defend himself against all detractors. I am not aware that Capt. Pryor has "attacked" anybody; I have seen no evidence of anything of the sort. If the directors are kept off the mine, and the local committee take the affairs entirely into their own hands, prosperity may attend the works; and if so, surely the credit of introducing the mine to the shareholders will be given to Capt. Pryor, for he did it.

Culstock, April 10.

AN OBSERVANT MINER.

#### NEW CONSOLS MINE.

SIR,—Everybody writes on New Consols, gives gratuitous advice, and from disinterested motives. The mine they affirm will, in the course of a few hours, be transformed from a New Consols into a Consolidated Virginia, if only their advice is acted on, but nothing what the writer saw at New Consols justifies him in corroborating the above. What New Consols wants is an analytical chemist, who should take samples or superintend the taking of them, just as the assayer does the piles that are drawn from underground. All worthless stuff would then be treated only as rubbish, and the lode which contained the highest produce or largest percentage would most readily be convertible into the metal. Such a chemist could undoubtedly be procured for a salary of from 120l. to 150l. a year. Mr. Valentine, of the Royal College of Chemistry, South Kensington, would no doubt on application recommend one suitable, as something more than a smattering of scientific terms is required in a mine that adopts the Nascent Process.

April 11.

EDWARD SKEWES.

#### NEW CONSOLS MINE.

SIR,—I have read with considerable amusement the letters on this subject which appear in your last issue, as I am pretty well acquainted with the way affairs have been conducted for the last year or two. It is pretty evident that "A Shareholder" is for some reason most anxious to shift all the blame of the much maligned directors and on to Capt. Pryor. It appears to me that his strenuous efforts to do so betray the fact that he is a very interested party, and trembles for consequences that may fall on his own head. I consider that "A Shareholder" has taken a very contemptible course of action by making such serious charges, which I quite believe to be without foundation, in an anonymous letter, when the opportunity was open to him to ventilate his opinions in an honourable manner at a meeting of the shareholders a few days ago, when he could have given Capt. Pryor a chance to reply or explain. But these tactics do not appear to suit your correspondent, and I venture to prophesy that not a word will be heard to say against Capt. Pryor at the meeting to be held to-day. As another shareholder I hold Mr. C. Satterthwaite and his co-directors responsible for the proper conduct of the finances (which have so woefully come to grief). But it appears to me that Mr. Satterthwaite has taken upon himself to do much more than he has been capable of, and thousands of pounds have, in my opinion, been consequently thrown away, which would not have occurred had not the manager's hands been tied by (as far as mining matters are concerned) inexperienced men. Everybody residing near the mine knows how things have been working of late, and Capt. Pryor's conduct and character can, and I trust will, be fully



indicated, but it behoves everybody to do their utmost to pull things together if possible, and make the concern a success.  
A CREDITOR.  
Callington, April 10.

## BEDFORD UNITED MINES.

Sm.—If the writer of the letter, in last week's Journal, signed "A Vigilant Shareholder," is a shareholder in this company, and will correspond with me direct, in his own name, I will give him all the information I can with respect to the Bridge lode, south lode, or any other lode in the sett, and opinions thereon; but it is not my intention to publish, nor should I be justified in making public, the names or names of the authorities who have expressed their views on the said lodes merely for the satisfaction of an anonymous correspondent, and who may or may not be interested in the mine.  
Cornhill, April 9.

T. B. LAWS, Sec.

## CARDIGANSHIRE MINES, A.D. 1877—No. XI.

Sm.—Resuming my remarks from last week, we next come to West Cwmymylog, where nothing has been done for some time past. The same remarks will apply to Cwm Darren. At Great Darren good machinery has been erected, and some underground operations carried forward, without, however, as yet meeting with any very beneficial results. The lode at this mine is of very great width, being worked away at surface for a long distance, for from 60 to 80 feet wide, and it has yielded a very large amount of lead ore, rich in silver. When we look at its situation, and compare the depth of the deepest workings with its next neighbour, South Darren, which is nearly 1000 fms. deeper than the Great Darren, and the rich courses of ore now being laid open in the bottom levels, it would be most absurd for one moment to think that the very extensive courses of ore laid open at surface, and the shallow levels hitherto worked, have been unbottomed. Perseverance and attention must ultimately achieve for this property an unbounded success. The dressing machinery that has been put up is, perhaps, the best in Cardiganshire; it is Green's self-acting, and I may say without much boast that it is scarcely to be surpassed; it is extracting a good deal of ore from the old wastes and other parts of the mine that would not pay without, but with it they derive some profit, which helps considerably in carrying out at no very distant date will amply reward them for their present and continued outlay. Borlase, in his "History of Cornwall," written about 160 or 170 years ago, speaks of his visiting this mine, and describes it plainly with the work then being carried out, and says that it was at that date the richest mine in Cardiganshire.

We next come to the Junction Mine, supposed to be a piece of ground where the lodes of Great Darren and South Darren form a junction, and hence its name. A shaft has been sunk a few fathoms from surface, which produced lodestuff of a very fine description. Machinery must be erected to give it a trial, of which it is most deserving. We come next to South Darren. The machinery for some years past has been in a very dilapidated state, and little or no sinking could be carried on; the consequence was that most of the ore ground in the upper levels had to be taken away in order to keep up the returns, so that the mine became almost exhausted. Good machinery for all purposes, including pumping, drawing, crushing, and dressing, is now being erected, and when these are completed I am persuaded the vein will be found sufficiently productive to pay the spirited shareholders a really good percentage for their outlay, which they most richly deserve.

I hope to continue my further remarks next week, commencing with Cwm Erlin.  
Goginan, Aberystwith, April 11.

ABSALOM FRANCIS.

## WATER-WHEELS.

Sm.—I shall be much obliged if some of your correspondents would kindly state the difference in the power of an over-shot wheel 40 ft. in diameter and 4 ft. breast and a turbine wheel 40 ft. in diameter, or whether a larger volume of water would be required for the turbine than the over-shot wheel, or what would be the least fall of water that would be sufficient for the turbine? Would there be much difference in the cost of the two wheels?  
April 10.

ENQUIRER.

## THE SO-CALLED BARNARD PROCESS.

Sm.—Mr. Barnard is again thrusting himself into notice, and, deterred by the correspondence of two years ago in the Journal, seeks to foist on ignorant people the Nascent process as his own. He has been exceedingly quiet for some time past; but, as the Virtuous Lady is being again puffed up, and the wonderful merits of that unfortunately constituted female are again being discussed, it appears that the old tale of "my process" is being revived, with a view, no doubt, to the enlistment of the sympathies of your readers with Mr. Barnard as a clever, but misunderstood, individual. It is desirable, however, that these matters should be ventilated, and, as Mr. Barnard is the principal person interested in the question, perhaps he will be good enough to reply to the following queries:—

- 1.—Is it not the fact that the so-called Nascent process is the identical process which has been carried out for many years in Scotland, at Newcastle-on-Tyne, near Manchester, Widnes, and other places?
- 2.—Is it not the fact that Mr. Barnard simply "imported" the process from Lancashire or some other county, and because it was unknown in Cornwall patented it (!), and called it his?
- 3.—Is not the process fully described in most works on Metallurgy, and has it not been thoroughly known for the last 15 years?
- 4.—Will Mr. Barnard have the kindness to explain what essential difference exists between the chemical treatment at New Consols Works and the other large works scattered over the kingdom?

These will be enough for the moment; but I may tell Mr. Barnard that I am practically acquainted with all the principal works in the kingdom, and I have even been to the New Consols Works, and I fail to see a particle of difference between the method of treatment pursued at either one or the other. Mr. Barnard's patent is "fudge," and if he fail to establish some new point in the process then I may tell him that it is open for all the world to adopt it. It is common property, it is no secret, and it is no patent.

I know nothing of the Virtuous Lady, nor of the King and Queen Mines. I dare say they are no better than scores of others, neither do I believe half of what is said of them by Mr. Barnard, and all the "assays" in the world will not alter my opinion that "assays" are delusive baits. But I do know something of the "wet process" as used here and abroad, and I tell Mr. Barnard that his new patent process was in full operation and well known when "sucking eggs" was with him a greater novelty than it is at present.  
Manchester, April 10.

R. J.

[For remainder of Original Correspondence, see to-day's Journal.]

TREATING PARAFFIN.—With a view to realise in an expeditious and economical manner the separation of the oil and colouring matter from paraffin, and the separation from each other of the constituents of other fats or fatty matters, whose constituents have different melting points, Mr. F. G. MORRIS, of Deptford, proposes to place the cakes or pieces of paraffin or other fats or fatty compounds in shallow boxes or cases constructed with perforated sides, interposing a quantity of common soda or other alkali between the cakes or pieces of paraffin or fat or fatty compound. The boxes or cases may each be composed of a frame of wood forming four lateral parts or sides, say about 1 in. wide, and of two perforated sheets of zinc forming the two other and larger lateral parts or sides; one at least of the perforated sides must be made removable for the introduction of the material to be treated. The perforated boxes or cases are placed about 2 in. apart in a tank of water heated by steam or otherwise (but preferably by steam) to a temperature slightly below that which will melt the constituent having the higher melting point, and the temperature is then regulated to allow the heat to gradually extract the constituent or constituents which melt at lower temperatures, as for example in the case of paraffin, to gradually extract the oil and colouring matter. As this operation is repeated the paraffin is finished and filtered in the ordinary way. For some operations, perforated boxes or cases as herein described may be employed

without the use of alkali. The perforated boxes or cases may be arranged horizontally or vertically, and may be fixed, or may have an oscillatory or rotatory motion, according to requirement.

## THE MINERAL RESOURCES OF CANADA.

## THE FRONTENAC LEAD MINES.

The regular and satisfactory dividends which for some time past investors in carefully selected lead mines have been receiving have naturally given capitalists generally great confidence in that class of property, and attention has, consequently, been directed not only to the lead mines of this country, but to those of the colonies and elsewhere—the Frontenac property, near Kingston, Ontario, being one which has given so much encouragement whilst in process of development as to claim prominent notice. No one could have read Dr. Dawson's celebrated volume on "Acadian Geology" without becoming convinced that Canada affords a field for profitable mining enterprise which will enable it to secure as good a reputation among miners as any other country; and as Dr. Dawson describes the Frontenac as "by much the most important deposit of lead hitherto found in Canada, or in the neighbouring parts of the United States," there would appear to be every justification for giving the property so complete a trial that its value shall be thoroughly demonstrated. To ensure this the FRONTENAC LEAD MINING AND SMELTING COMPANY was formed some two years since with a capital of 100,000*l.*, in shares of 1*l.* each, one-half of which was allotted to the vendors as purchase money for the property, leaving 50,000*l.* available for working capital. Hitherto the shares have been in very few hands, and comparatively little, in England at least, has been heard of the company, yet the development of the mines has been energetically going on, and parcels of lead ore have been shipped to England, and sold at prices which leave no doubt as to the value of the deposit or the returns obtainable from it.

Everything appears to have been done to bring the mine into good working condition. The mining buildings erected upon the property, which is about 200 acres in extent, comprise amongst others a crushing mill, blacksmiths' shop, boarding house, powder house, shaft house, blast furnace, stables, &c., and there is an abundance of timber available for smelting and building purposes. The lode averages 12 ft. in width, and a lease of the mineral rights over the adjoining estate having been acquired about a mile on the lode can be worked. The workings have only reached a depth of 120 ft., yet large parcels of lead have been sold, and the bottom is the richest part of the mine, the improvement having been so gradual all the way down as to leave no doubt of further increase of richness in depth. The mine is in good working order, and it is considered that very little further outlay is required to insure largely increased returns. It is, therefore, proposed to issue the unappropriated shares, and as the full working capital originally contemplated will then be available the operations will be carried on with increased vigour, and the mine will, it is fully believed, become the most important in Canada. Until considerably more work is done all estimates as to the probable annual returns will, of course, be quite problematical, but when the opinions of such men as Principal Dawson, F.R.S. of McGill University, Montreal; Professor Chapman, of University College, Toronto; and Mr. Robb, whose admirable little work "Metals in Canada" leave no doubt as to his ability as a practical miner, can be cited in favour of the property it must be pretty well evident that the risks undertaken in developing it are not unusually large.

Referring to the prospects of the property when far less work than at present had been done, Prof. Chapman declared that in its surface aspect the location presents very favourable conditions for mining purposes. The southern portion consists of high ground, intersected by narrow valleys running in a general north and south direction, or parallel with the strike of the strata, whilst towards the north the high ground terminates in a more or less abrupt escarpment, the general trend of which is not far removed from east and west, its course being thus nearly at right angles to the direction of the valleys. North of the escarpment the ground slopes gently towards a small sheet of water known as Indian Lake. By this outlet water communication might be established, if thought desirable, with the Rideau Canal, but a more direct communication with the front is afforded by several roads, the distance from Kingston by one of these being under 16 miles. This lake is not the only water supply on the property. A small but unfailing stream flows through the mine, and empties itself into the lake. It can be made available at a very trifling expense for washing and dressing the ore derived from the mine. It runs in close proximity to the mouth of an adit now being driven on the property, and is within a few hundred feet of the principal shaft. At the same time Mr. Charles Robb stated that the rocks by which this tract is underlaid consist of alternating bands of grey and red Laurentian gneiss, interstratified with crystalline limestone of the same geological age, and overlaid at some points by outlying patches of the inferior member of the Lower Silurian formation—the Potsdam sandstone. In such geological position and mineral conditions veins of galena, of greater or less importance, have been partially developed at several places in Canada, most of which have been visited by him, but nowhere, so far as he has observed, did they assume at all the same importance, both as regards size and richness, as on this property. The strike, or general direction, of the rocks is north 45° east, with a dip to west at an angle of about 75°.

The course of the lead bearing veins, several of which have been discovered on this property, varies from North 55° west to north 65° west, thus constituting true or fissure veins, cutting the rocks transversely and resulting from powerful and deep-seated disturbances and dislocations; hence they will undoubtedly prove persistent in depth to an indefinite extent. They belong in fact to, and probably constitute, the central, richest, and most important section of the great group or system of lead-bearing lodes, which, following the general direction indicated, traverse the Laurentian rocks from Northern New York to Peterborough County in Canada; and have been more or less extensively developed at and near Rossie, New York, and in the townships of Lansdowne, Bedford, Storrington, Loughborough, Tador, Lake, Methuen, and Galway in Ontario. Being thus persistent over such a great linear extent, there is every reason to believe that these veins will prove correspondingly so in depth.

But, turning to more recent reports, reference may be made to those which are at the present time being received from Capt. John Hancock, jun., the agent at the mines, who under date March 20, reports that the lode in the 18 fm. level, west of West's engine-shaft, is looking better than when he last reported. It is 7 ft. wide, and worth 2½ tons of galena per fathom, but is not quite so favourable for driving. The winze sinking below the 8 is worth 1½ ton of ore per fathom. They had on the previous day bored a hole through to the back of the 18; there was 5 ft. more to sink. This would take them six or eight days to complete. They had only crushed once since the previous week, owing to a slight breakage in the crusher and jigger. It is put all right again, and at date of writing they were again almost ready to crush if there is not too much frost. There is about 18 tons of clean and 10 tons of undressed ore on the mine. They had a little more stuff to draw than they calculated on in the past week, for that reason they did not begin to sink the engine-shaft as proposed, but intended to do so on the following day.

The directors have taken all the necessary steps for increasing the speed of working; a larger number of men will be employed underground. Arrangements have been made with the American Diamond Drill Company to put down the shaft at a fixed price per fathom. A number of Taylor's improved jiggers have been purchased, and practical smelters will be sent out to convert the galena into pig-lead on the spot, or at least at Kingston, whence it can readily be sent to the various markets within easy reach, and where as much as the company can make for many years to come will be readily taken, and at a price which, whilst commanding the trade, will leave the company nearly 10*l.* per ton additional profit as compared with sending the ore to England. The prospects appear to be excellent, and the directors are evidently intent upon doing their utmost to make the best of them.

## Meetings of Public Companies.

## WEST-MOYSTYN COAL AND IRON COMPANY.

A meeting of shareholders was held at the Cannon-street Hotel on Wednesday. Col. SHAKESPEAR in the chair.  
Mr. DAVIES (the secretary) read the notice calling the meeting the report of the directors was taken as read.

The CHAIRMAN commenced by congratulating the shareholders on the position of the works. Since the last meeting, which was held in August, the board had prosecuted the works, and had gone down below the first seam, where they had found a slight fault, which was by no means an uncommon occurrence in such enterprises. The manager was present, and would be happy to answer any question, but the shareholders would be glad to hear that the first seam promised exceedingly well. At the present time, unfortunately, they were in this position—that they required about 40,000*l.* to develop the property to the fullest extent. This part of the subject he would leave to Mr. Rylands to explain, who would give the view of the directors on the subject. At the same time, as the account showed, there was no pressing need for money, but there was also no doubt that the sooner the work was proceeded with the better. With regard to the second shaft, it would take 18 months to complete, and to place the colliery in such a position that they could send coal to market. He went on to point out the advantageous position of the colliery compared with other centres which were now supplying the markets of Liverpool and Birkenhead; those centres were Rhondda, Ebbw Vale, and other coal fields in South Wales, whereas this company's collieries were within 13 miles of Liverpool, so that it had the advantage of being able to place the coal upon the market at a cheaper rate. In conclusion, he (the Chairman) moved the adoption of the report and accounts.

Mr. RYLANDS, M.P., seconded the resolution, and recalled the circumstances under which the company was first started. At that time there seemed to be a popular delusion that coal properties constituted the most desirable investment that possibly could be gone into, and money was withdrawn, in many cases, from other investments in order to be placed in coal properties. It was also thought that a man who purchased a property at whatever price had joined something that, in the long run, would turn out a bargain. Now, however, matters were quite the other way, and there was now a tendency to depreciate colliery properties in a corresponding ratio. Some years ago an appeal for money to develop such a colliery as this would probably have been responded to with the utmost readiness, but now they would have to consider ways and means more carefully than they would have had to do under the former condition of things. The board were desirous, on the one hand, of not making the inducement to take up fresh capital too slight, and, on the other hand, of not making it too onerous for the shareholders. Therefore they thought that 40,000*l.*, at an interest not exceeding 6 per cent., would answer the purposes, besides which they had over 43,000*l.* worth of shares in hand which they could distribute as a bonus, say, for instance, among the company's debenture holders, for that was the form in which the directors would recommend the capital to be raised. For every 5*l.* debenture-holder it had been proposed to give an equal amount in shares, and in this way the exigencies of the company would be met. Still they need not raise the money at once, but simply await the return of better times, although reasons could be advanced to show the sooner they proceeded with these works the better.

After a desultory and unimportant discussion the report was adopted.  
Mr. RUSSELL EVANS said they now came to the real business of the meeting, which was to raise fresh capital, and he gave a general approval of the plan proposed. His own calculation was that the profit per ton would be about 2*s.*, after allowing for every cost on the most liberal scale. He concluded by moving that the directors should be asked to mature a scheme and call a meeting at a later date.

The resolution was seconded by Mr. MANNING, and carried.  
A resolution was also proposed approving of an agreement with Sir Pyers Moystyn, which agreement reduced the dead rent and royalty very considerably. This resolution was carried.  
The retiring directors, Mr. Rylands, M.P., and Mr. Henry White, were re-elected. The auditors were also re-elected, and a vote of thanks to the Chairman and directors closed the proceedings.

## LINARES LEAD MINING COMPANY.

The half-yearly general meeting was held at the company's offices, Queen-street-place, on Thursday.—Mr. W. Cox in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, which the Chairman then declared duly constituted, and the report, of which the subjoined is an abstract, was submitted:—

The directors congratulate the shareholders upon the continued success of the undertaking. During the year just terminated the total profits amounted to 14,275*l.* 9*s.* 4*d.*, of which 7290*l.* 1*s.* 7*d.* was the net gain on the six months' working to Dec. 31. The last-named result has been obtained on a production of 2050 tons of ore, raised at a total mining cost of 15,915*l.* 6*s.* 3*d.*. In addition to this expenditure an outlay of 734*l.* 10*s.* 11*d.* was made on the Pozo Ancho Mine in preparing and sinking Santo Tomas shaft, and the cost has been charged against the reserve fund, as announced by the Chairman that it would be at the general meeting held in April last. This shaft is now being sunk below the 120, and will be carried down to a depth of 132 fms., when levels will be driven east and west on the course of the lode. At the 120 the lode is large and powerful, containing good stones of lead ore. This level will be driven under the long run of ore ground which proved so productive in some of the upper workings; we look for some discoveries of value in the new explorations. Considerable extension has been given to the levels at Peil's and Warner's shafts, and much new ore ground has been opened out.

At Quinientos, likewise, the explorations have continued to be carried on without interruption, but at this mine the discoveries have scarcely reached the average of previous half-years. The reserves of ore at the various mines are estimated at a total of 2400 tons, showing no variation from the estimate made by Mr. Tonkin and the mining agents six months ago. In order to give fuller employment to the Cordova Smelting Works, and with the view of opening up another source of gain to the company, the directors have recently negotiated the purchase of a reserve supply of ore, for delivery during the next 12 months, on terms which they believe will leave a fair margin for profit. The smelting works at Cordova are in first rate condition, and are well provided with the necessary plant for yielding a good produce from the ore at a low rate of cost. The company will soon be in an excellent position for transporting the ores from the mines to the smelting works, as the railway company have recently constructed a branch line from the town of Linares to the company's Pozo Ancho Mine, and Mr. Tonkin states that it will be opened for traffic shortly. The branch line from Badolosa Station to the town of Linares is now open. The lead market has not been very active, but there has been a great test during the past half-year; 20*l.* 10*s.* per ton is the average price at which the sales of silver lead have been made during that period. The balance-sheet shows that the amount which stood at the credit of the reserved fund, after writing off the expenditure incurred at Santo Tomas shaft, was 3497*l.* 18*s.* 8*d.*; to this the directors have added 500*l.*, thus bringing up the fund to 3997*l.* 18*s.* 8*d.*. After deducting the dividend (9*s.* per share), and the amount carried to the reserved fund, a balance will remain to the credit of the profit and loss account of 774*l.* 1*s.* 8*d.*

The CHAIRMAN said he had not many observations to make, as the report was very full and detailed; however, there were one or two points to which he would like to refer. In the first place, he should like to call attention to what took place in that room twelve months ago. At that time he asked the shareholders whether they would go with him in resuming the work at the old Pozo Ancho Mine, which they had abandoned. Over the portions of this mine they proposed to work they had a good mine, which had given good dividends, and at that meeting the shareholders agreed that they should resume working, and apply some of the money from the reserve fund to meet some of the extra expenses which would be incurred in the work. At that time they added 500*l.* to the reserve, and since then they had added another 500*l.*. They had spent during that time 744*l.*, so that really the reserve now stood at 260*l.* more than it did 12 months ago. With this 744*l.* they re-timbered the shaft, and got to the 120, and were now driving that level. He was sorry to say he could not yet refer to any good results, but they did not expect much from where they were at present, but when they got down another 10 fms. or 12 fms. he hoped they would find the same richness below as had existed above. The work was going on vigorously, and he hoped that day 12 months he would be able to tell them something more satisfactory about it. In conclusion the Chairman moved the adoption of the report and accounts.

Mr. JOLLIFF seconded the resolution, and asked whether up to the present any satisfactory vein had been met with as the result of the operations?

The CHAIRMAN: Not up to the present, but our prospects are good. As Mr. Richard Taylor had once remarked, it was a cowardly piece of mining ever to have abandoned it. As he had said, operations had been resumed at the 120. They had found good stones of lead, but at present they had not met with paying ore.

A SHAREHOLDER: What further expenses will be incurred before you get there?

The CHAIRMAN: The expenses are about 150*l.* per month.

Mr. JOLLIFF, in reply to some observations, said the Quinientos Mine had given 100 tons per month, which, although, *per se*, was not very profitable, yet when they added that quantity to the other quantities the general expenses were divided over a sum which was, on the whole, satisfactory. At the Pozo Ancho Mine, where the numerous discoveries of ore were made formerly, they had deepened the mine and driven eastward; the ground had been rich in ore, but had been worked out. His brother and himself had always looked upon a mine as a terminable annuity, but their efforts had been to make that annuity as long as they could; they had prolonged, and the mine was in a good state still, and by working this and the Quinientos together he hoped they would continue to give handsome dividends. Certainly he thought they would be cowardly if they did not carry on operations. The lodes in Linares were in granite rock, which was generally a rock in which good mines were found. It was quite on the cards, and he was going to say reasonable to expect that with the new explorations which would be carried on they would meet with nice deposits of ore under one of the most extraordinary mines which had ever been worked. In the meantime they were working that part of the mine with great vigour. The point to the north was ground which was called San Francisco, and although the vein was not wide still it was almost solid ore, so that from this, and with the assistance of what they got out at Warner's, the prospects were fair for continuing the mine profitably for a series of years, and by carrying on the explorations vigorously he hoped they would keep up good returns. The finances were in a satisfactory position. As regarded the supply of ore, the company had very valuable premises at Cordova, and smelting-works built upon their own freehold, within a very moderate distance of the town, which had



a large population with a very small amount of employment, and that was one reason why they chose the town of Cordova, which was half way between the mine and the coast. The directors also thought they would get coal cheaper there, as there was a colliery immediately north of the town, which supplied coal at a cheap rate. Thinking the smelting works might be without a full supply of ore, the directors thought it wise to make some purchases of ore in the market, which they did advantageously, the credit of the company being good. The staff was also kept in full operation, and if they could possibly do it the directors would repeat the operation, but at the present time the price of ore was rather increased, whereas the price of lead had gone down, and for the present the directors had held their hands in that direction. The company had very intelligent agents upon the spot. The report was then adopted.

On the motion of the CHAIRMAN, seconded by Mr. CROSBY, the retiring directors, Messrs. Pell and Bigge, were re-elected. The auditors, Messrs. Agar and Carter, were re-appointed.

Mr. J. TAYLOR moved a cordial vote of thanks to the Chairman. He said that Mr. Cox gave a very large amount of time and attention to the company, and the company was under a great debt of gratitude to that gentleman.

Mr. JOLLIFFE seconded the resolution, which was put and carried. The CHAIRMAN acknowledged the compliment, and said his brother directors had already given him a very handsome testimonial in the shape of a silver kettle, and he need scarcely say that he valued this testimonial, and also the present vote of thanks, very highly.

On the motion of Mr. CROSBY a vote of thanks was then passed to the directors, and the meeting broke up.

#### ALAMILLOS COMPANY.

The half-yearly general meeting of shareholders was held at the company's office, Queen-street-place, on Thursday, Mr. W. COX in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, which was then declared duly constituted, and the report, of which the subjoined is an abstract, was submitted:—

The audited accounts to Dec. 31 show a profit of £192,653.31. This amount is less than £100,000, the profit of the previous six months. About 90% of this sum is accounted for by the reduced raisings of ore, the remainder by the less favourable price obtained for the lead sold in Spain. The account is affected in various other ways to a small extent, but the above mentioned are the only items which require special notice. The mining operations have been carried on with all possible economy, and a large amount of exploratory work has been done. The result, however, has on the whole been disappointing; for, in order to raise 1200 tons of ore which has been brought into the account, it has been necessary to take 250 tons from the reserves, thereby reducing them to 2250 tons. The points of chief promise in the mines at the present time are the 100, east and west of Taylor's engine-shaft, the 85, west of San Adriano shaft, and the 60, east of Judd's cross-cut. The levels are being driven vigorously, and from these and other explorations, the directors hope good ore ground may be opened in the present half year. The directors have made some further purchases of lead ore, and in their next published accounts they hope to show that a fair profit has been realised from this source. A portion of these ores are being smelted at the Fortuna Company's works at Linares, the remainder at the Cordova Smelting Works. In order that the company may be in a position to carry out the smelting of purchased ores and ores from their own mines to the best advantage, the directors have purchased a piece of ground at Cordova, from the Linares Company, at a cost of about £1000; this ground is sufficiently large to admit of the erection of seven furnaces, but the directors intend to erect five only for the present. The cost of these works will be charged to the reserved fund, as the directors feel that it is the best investment of this fund they could make. The branch line of railway from Badolano Station to the town of Linares is now open for traffic, and from thence the line has been extended to Pozo Ancho Mine, which gives large returns, and which was worth while for traffic. The company will then have railway communication from the mines to the coast. The balance standing to the credit of the profit and loss account, £137,145.10s., enables the directors to pay a dividend of 1s. per share, £1750, and to carry forward to next account £107,145.10s.

The CHAIRMAN moved the adoption of the report and accounts. He regretted the Chairman was unavoidably absent; he was sure this was a cause of regret to Mr. Judd, who was most anxious to be present, more especially as the mine was not in quite so flourishing a condition, and, therefore, was all the more anxious to give the reasons why such was the case. Twelve months ago the shareholders authorised the board to expend some money out of reserve for making various explorations. The directors had been going on with the explorations, and had spent during the past half-year about £500, for extra work, in the hope that something, as Mr. Micaewer would say, would "turn up." But unfortunately, during the last twelve months they had not been successful in finding a proper return for the money expended; but that was no reason why they should leave off making these explorations, because from the enormous amount of property they had there was reason to hope that discoveries might be made. When the company first started there was a part of the mine called La Magdalena, which gave large returns, and which was worth while for traffic. The company will then have railway communication from the mines to the coast. The balance standing to the credit of the profit and loss account, £137,145.10s., enables the directors to pay a dividend of 1s. per share, £1750, and to carry forward to next account £107,145.10s.

Mr. PARTON seconded the resolution. A SHAREHOLDER asked what were the views of the directors about the smelting works?—The CHAIRMAN said they had made a fair profit on the purchased ores, and when the Alamillos ore was falling off the directors purchased about 1500 tons of ore for smelting, which it was calculated would leave a profit. At the same time this was a business which required great caution and care, but the shareholders need not be under any apprehension of loss from this source.

Mr. R. TAYLOR pointed out that this company had a very large extent of ground which was entirely unexplored. There were a number of small mines, but the one in the centre of the lower section was much more extensive, and there was every probability that future discoveries of ore would be made. They might have seasons of poverty in the levels, as they had had lately, but on the whole he believed they would find the Alamillos Mine would continue to be a profitably productive one, producing ore enough to give a good profit. Most of these mines were comparatively shallow compared with others in the district, but near Taylor's shaft there was a greater depth than at any of the other workings, and they had there every prospect of finding good ore ground, a rich vein being seen in the level above it. The reserves of ore had been somewhat treasured upon to keep up the returns which were made, but not to an extent to cause anything like alarm. As regarded the smelting of the ore it was a business which might be said generally to be successful throughout Europe, but the system of selling the produce of the mines which had been pursued in the Linares district was one which made the risk greater than in most others. It had become a practice there for many of the larger mines to sell the entire produce for the 12 months at a fixed price. This company had been careful not to enter into anything of the kind, but had made considerable purchases at a time when the ore seemed to be cheaper in proportion to the price of lead. Unfortunately the price of lead had recently dropped, but from the fact that the company had sold the lead previously, the fall in the price would not disappoint the hope of reasonable profit on the transaction. When last in Spain he made an endeavour to purchase ores upon a more reasonable system—namely, that of making a contract for a year's produce, with a sliding scale of prices regulated by the price of lead in the London market. In this case he did succeed in getting the produce of one pretty large mine, nearly 5000 tons in all; he was able to let this company have half upon terms regulated by the price of lead in the London market. If they could get that system more adopted the smelting works would be more profitable.

The CHAIRMAN, in answer to a question about the railway, said the branch line of railway from Badolano Station to the town of Linares was now open for traffic, and from thence the line has been extended to Pozo Ancho Mine. The latter was completed, and would shortly be available for traffic. The company would then have railway communication from the mines to the coast.

The report was then adopted. Mr. W. COX and Mr. Carter were re-appointed directors. The auditors—Mr. St. John and Mr. Carter—were re-appointed. A vote of thanks to the Chairman and directors closed the proceedings.

#### FORTUNA COMPANY.

The half-yearly general meeting of shareholders was held at the company's office, Queen-street-place, on Thursday, Mr. R. HENTY in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, which the CHAIRMAN then declared duly constituted, and the report, of which the subjoined is an abstract, was then submitted:

The statement of accounts gives the details of the costs and returns, and thus exhibits the results of the half-year's working. The profit for the period now under review amounted to £494,185.13s., being a slight improvement on the gain of the preceding six months. This profit has been obtained from the mining operations only, but the directors hope the next account will show a profit on ore purchases as well. Several parcels of ore have been secured on advantageous terms. Some of these have already been smelted; others are now in course of treatment. The smelting works at the mines, under the immediate direction of Mr. Tonkin, are maintained in a state of great efficiency. The flues of the furnace-house have been considerably extended during the six months, at a cost of £88,95.24s., and it is expected that the value of the lead which will be saved by this extension will recompense the outlay in two years; the cost will, therefore, be spread over that period. The superintendent and mining agents' reports supply full information in reference to the works of trial which have been carried on at the mines during the half-year. Both the Canada Inco and the Salinas Mines have opened out well during that period, and the directors have no reason to apprehend any falling off in their productiveness during the half year now entered upon. The quantity of discovered ore in the mines is again estimated at 7800 tons. The mining agents' report describes the principal drivings and sinkings which are likely to develop ore ground during the present six months, and it will be seen that they anticipate a favourable result from these operations. At no previous period in the company's history has the carriage question presented such a favourable aspect as at the present time. This arises from the fact that there will soon be railway communication for the entire distance from the mines to the port of shipment. The last few miles of the line from the town of Linares to Pozo Ancho Mine will probably be opened for traffic in a few weeks. The dividend just declared (6s. 8d. per share) is the same as in the autumn of last year. The directors have added the sum of £500, to the reserved fund, which now amounts to £244,105.24s. All sums which had been placed to the reserved fund prior to Dec. 31 last were invested in 3 per cent. Consols.

The CHAIRMAN, in moving the adoption of the report and accounts, remarked that he had nothing to say which was not perfectly satisfactory to the shareholders. There was a slight increase

of profit to the extent of about 160%, but looking at the fluctuations in the market that was not unsatisfactory. The smelting had also gone on well. The Fortuna Company had begun to purchase ores in the hope of making some additional profit to their mining operations. That had not yet come into operation as regarded the return of profit, but he hoped it would do so satisfactorily before the next meeting. The question of carriage was one which was going on generally to the satisfaction of the directors, and the facilities which had been accorded by the railway had tended considerably to reduce the cost and charges; and, therefore, the company was deriving some benefit from that. The new railway which was contemplated would be within a mile of the works; which, of course, would be a benefit to some extent. In all probability they would have the advantage of getting a small line to the works, which would tend to reduce the cost still further. The returns from the mine had been about the same, perhaps slightly in advance, but not material. The average value of the lode was about the same that it was six months ago. Sometimes they had had a little better, and sometimes a little worse, but it was now about the same that it had been for a long time. This was so far satisfactory, and if the price of lead went up the company would benefit by it.

A SHAREHOLDER said he was afraid there was every prospect of a war, in which case no doubt the price of lead would go up.

The CHAIRMAN said it was stated that Russia had well provided herself with lead, and therefore, possibly, the outbreak of war would not have such an effect on the price of lead as some people might imagine. He moved the adoption of the report and accounts. A SHAREHOLDER seconded the resolution. Mr. R. TAYLOR said the condition of the mine was, on the whole, satisfactory, and the returns had been maintained without reduction of the reserves of ore. He thought they might calculate upon going on as they had been, and make very handsome profits, unless any very great depression should take place in the price of lead. It was really a very doubtful matter whether war would increase the price of lead. He believed the Turks were supplied with bullets chiefly from New York, and the American merchants had, during the past six months, purchased considerable quantities of pig-lead, which he was informed was converted into bullets at New York, and re-shipped to Turkey. Within the last few days there were some indications of a renewal of those purchases, but there had been no symptoms of an advance in the price of lead; on the contrary, the price was rather lower now than a month ago. If the price of lead were maintained at where it was now—at any rate, at where it was last year—they might calculate upon having nearly as large a profit as last year. That was an element in the calculation which they could not in any degree control, but which they must take into account. He referred to the old working of the Pozo Ancho Mine by Mr. Duncan Shaw, who was the first Englishman to work mines in the district, and whose efforts had been attended with so much success. During the 25 years that the Linares, Alamillos, and Fortuna Mines had been in operation they had returned no less than £530,000, of profits to the shareholders.

The resolution for the adoption of the report and accounts was then put and carried. The retiring directors—Messrs. J. Taylor, J. P. Judd, and F. W. Bigge—were re-elected, and Mr. St. John and Mr. Dorington were re-appointed auditors. Votes of thanks were passed to the Chairman, directors, and management abroad, and the meeting broke up.

#### NEW CONSOLS SILVER AND ARSENIC WORKS.

The extraordinary general meeting of shareholders, adjourned from March 23, was held at No. 1, Queen Victoria-street, on Tuesday, Sir JAMES ANDERSON in the chair.

Mr. WATSON SMITH (the secretary) read the notice convening the meeting.

The CHAIRMAN expressed his regret that there was not a larger number of shareholders present, as the meeting had been adjourned more with a view of consulting the proprietors than anything else. In fact, the whole position hinged on the proprietors paying the calls which were due. He believed that if the calls were paid, with the assistance of the creditors and the local committee appointed since the previous meeting, the company could be placed in a position in which profits would be shown. A letter had that morning been received from the local committee which had been appointed to assist the directors in the conduct of the management of the business. He might mention that the document was signed by the chairman and by three members of the committee—who were all creditors, as well as shareholders. He would ask the secretary to read this letter.

The SECRETARY then read the following letter:—  
We think we should inform you that since our appointment as local managing committee we have held three meetings and gone into matters connected with this extensive property, and we have come to the unanimous opinion that if our recommendations are carried into effect we shall soon conclusively prove the value of the property and the fact that the work is being profitably worked. The first thing to be done is to pay the miners their overdue wages. These men are not only starving, but we can neither remove the products from the works nor commence the operations we wish to begin without further delay until this is done. We beg to impress upon the shareholders the great importance of this, and to ask them to pay up their calls forthwith, so as to make a fair start. If this is done the property can be saved; but if it is not at once carried out we shall be unable to bring the company round to a successful state. It must be remembered that although all operations have practically ceased, yet there is a necessary expense of about £1000 per month in pumping the water out of the mine, &c. No time should be lost in utilising this expenditure by resuming operations. The shareholders may not know that we are largely interested in the concern as creditors as well as shareholders. We have the strongest desire to aid the company, and living near the works, we shall be enabled to exercise a powerful check on the management and expenditure in all the future operations of the concern. We firmly believe that by economy and close attention large profits can be made; and as we have volunteered to help the concern in its present difficulties, we hope every effort will be given to us. The present state of affairs will be the means, in our opinion, of placing the mine on a sound basis for the future; and "out of evil cometh good." If the shareholders will take a real interest in our work by paying their calls without delay we promise to leave no stone unturned to bring about successful results for them. We must again beg of you to impress upon the shareholders the necessity of their paying in their calls at once, so that the men can be paid on or before the 1st. As you are aware, if this is not done there is no chance of saving the concern from being wound up in the Stannary Court.—For the committee, JAMES PEARCE, Chairman; THOMAS WESTLAKE, JOHN G. SPEARS, HENRY PEARCE.

The CHAIRMAN continuing said the shareholders would have heard from the letter which had just been read that the local committee—who lived on the spot—entertained the same favourable opinion of the property as those who had taken an active part in the direction of the affairs of the company for the past few years. He had nothing to add to the circular which was sent out preparatory to the meeting, of which the present meeting was the adjournment. The reasons for stopping the works had been fully explained, and as the reports of the meeting had been circulated amongst the shareholders they would be in possession of the whole of the facts. At the present time there remained nearly £4000, due from calls. If these calls were sent in the men could be paid comfortably, and there would be a balance, with which the directors and the local committee would be enabled to work successfully, to prove that the thing could be made profitable forthwith. They were the unfortunate stage of their existence at which a great deal of money had been expended in trying to force events against weather, breakages, and one thing and another, and this endeavour to force events had drained them of their money without producing any profitable results. At the same time, however, that this was going on the directors had been investigating (as the shareholders were told at the previous meeting) the different processes by which other companies were successful, but which had previously been unsuccessful, had made profits, that was by the adoption of a safe process for clearing the stuff before treating it chemically. They were glad to believe by those who knew more about these matters—by experts in the business, and by those who were using one or other of these processes—that they could at least double the amount of stuff which they were now treating at the same cost, and that in their estimation a considerable profit would inevitably follow. The directors were also of this opinion, and with an expenditure of about £2000, the whole of the necessary appliances could be purchased. This would, they believed, enable them to reject two-thirds of the stuff now treated at a cost of upwards of 30s. per ton, and would leave the remainder much richer and to be treated at a cost of not more than 10s. per ton. The local committee had considered the matter very elaborately, and they were of opinion that without any new plant whatever—with the stamps now on the ground, erected originally to treat the tin—they could at once reject at least half the stuff they had hitherto turning. At all events if the calls now due and overdue amounting to nearly £4000, were paid the men could be paid, and about £500, could be left as a working capital; besides there was on the ground upwards of 10000 worth of stores—iron, coal, and salt—available for treating the stuff, besides 500 or 600 tons of stuff half treated, and he thought about 10,000 worth of stuff broken and ready for treatment.

Capt. PRYOR said the costs of raising the stuff was included in the wages which they had to pay. There was also the produce of the arsenic and precipitate already in the flues, valued at £2000, if they had the labour to send it to market. If the calls had come in promptly there would have been no necessity to stop the works, and if the £10,000, which they had been endeavouring for some time to obtain as a minimum capital they would have been able to put the selecting process, and have gone on all right. Even the calls which had been made had not been paid regularly, and the board had been obliged to borrow and to lend their own money to carry on the company, and for his own part he would only be too happy if he were released from this responsibility. He had only now to urge those who had not paid their calls to do so at once, because if the company went into the Stannary Court—as it certainly would unless the men's wages were soon paid—the property would be lost, and the shareholders would have to pay their calls. The directors had no wish to be harsh in the matter, but the shareholders should remember that they had embarked in the matter as a speculation, and that they must take the chances of success or non-success. The shareholders should bear in mind what Mr. Warrington Smyth told them at the last meeting with respect to St. John's Bay Mine, which while all the ore raised was treated was quite unsuccessful, but when the process of selection was adopted, that success followed which was now so well known. With the amount of money in the bank

and that which would be received within a day or two, the amount of calls due would be reduced to about £3000; and he urged upon those who had not done so to pay their calls at once. If something were not done the company would soon go into the Stannary Court. He would now move.—That the letter from the committee be printed and circulated, and commended to the best consideration of the board and the shareholders.—Mr. SATTERTHWAITHE seconded the motion, which was carried unanimously.

The CHAIRMAN then moved.—That it is desirable that the petition be further adjourned, and that sanction be obtained to the payment by the board of the interim liquidator, or either of them, of any wages, claims, or sum in respect of the same, as the cash in hand or coming in may from time to time admit.

Mr. FLOUX seconded the motion. Mr. PRYOR, in reply to Mr. PHILLIPS, pointed out the desirability of passing the resolution as worded, stating that if it were passed he would at once present to the Vice-Warden, so that any proceedings might be stayed for a time.

The motion was carried *unanimously*. On the motion of the CHAIRMAN, seconded by Mr. SATTERTHWAITHE, the appointment of the local committee was approved.

It was then decided that the meeting should stand adjourned until May 4, at the same time and place.

The CHAIRMAN read the following from a letter from a shareholder and director of the company to the extent of 7000, remarking that the gentleman was willing to double his stake in the company if the present difficulties could be got over. I think it is foolish to think about winding up the company when all the money is made, and the mine is about to be paid off. Form a committee—say, one from Redruth and two from the neighbourhood of the mine—meet with the agents and the directors to sell the produce in the best market, and the committee being shareholders, you will soon see that you will be making profits of from £500 to £1000, per month. I shall be in Liverpool in a few weeks when I shall be able to get a price for your arsenic. You ought to get 9s. 10s. per ton for it, and I believe that in a very few weeks you will be able to get 10s. 10s. for some.

Mr. KENNELLY presumed that if the shareholders did not pay their calls, and the company came to be wound up, the liquidator would not enforce payment. The CHAIRMAN replied that the directors were anxious not to take any apparently harsh action if it could possibly be avoided. If the matter came into the hands of the Stannary Court the payment of calls would be forced in three weeks.

A SHAREHOLDER said he thought it was very unfair to those shareholders who had paid their calls as they became due that so large an amount of arrears should exist.

Mr. SATTERTHWAITHE said the proper thing to be done in the first instance was to clear away the wages claims. All the men were to give notice to leave, and they would only have to pay the legal wages up to the time that the Court was applied to. The wages that had accrued since that date would be the matter of the liquidation expenses if the company were wound up. The wages absolutely due would have to be provided under the provisions of the Stannary Court. He believed the amount would be something like £2500, but he could not be sure, and he thought there was about enough money in hand, and he apprehended that the pay of the men was now almost provided for. The difficulty so far as wages claim was that due on the 10th inst. The great question had been how best to get rid of the waste produce, and he thought they had now arrived at a point when a calculation could be based upon this matter. He based his calculations on 100 tons per day, having given the matter his most careful consideration, and having inspected the machines at Devon Consols and other mines, and had come to the conclusion—rightly or wrongly he could not say—that the system of separation by mechanical means was the right thing. The committee machinery would not be justified, but he believed that the present system of separating two-thirds of the waste stuff now treated, and if that were so he thought the expenditure would be a most judicious one, and he would explain why. Taking the output on 100 tons per day, that would be 3000 tons per month; and he had no doubt that Capt. Pryor could raise that amount easily. Estimating that at 10s. per ton, that would give £3000, per month. In rejecting two-thirds of this he would be left with 1000 tons, or 1000 tons of copper and silver or equal to 20 tons of precipitate would be lost, reducing the amount by £1000, to £2000. He took the cost of raising the 1000 tons at 8s. per ton, which was £8000; the crushing, at 2s. 6d. per ton, £2000; and jigging, &c., at 75s.—an expense which would at once get rid of two-thirds of the waste, and reduce the profitable portion of the works to 1000 tons of raising, which there would be no difficulty in treating. To do this he estimated the cost at 10s. per ton, or 1500s., as very little fuel would be required. Then they would have to take 1000 tons at about 8s. per ton, or 8000. Treating in the tanks would take 2500, treating for tin 2500, and for arsenic 2500, making together 25000, which would leave a profit of £1400, per month. This was his calculation, made after careful consideration. Anything like 500 or 700 tons per month could only result in a loss, but from all sources he heard that there would be no difficulty in raising 100 tons per day.

Mr. WESTLAKE (the largest creditor, and a member of the local committee) expressed his firm belief that if the company were placed on a satisfactory footing it would yield good results. He believed they had the best lode in the West of England, and that £1500, profit could easily be obtained. He would do all he could to make the company a success, and he urged the shareholders in default to pay their calls at once. He suggested that the debenture holders should stand back, so that an effort might be made to keep the mine going. He thought it would be wise to try the jigging and the stamps at the same time. (Hear, hear.) The CHAIRMAN, speaking for more than half the debenture holders, said he thought they would stand by for a good while if the company could be saved. Some shareholders having expressed a hope that the proprietors would attempt to overcome the present difficulties, especially by the payment of the calls due from them, the meeting closed with the usual compliments.

#### GREAT LAXEY MINING COMPANY (LIMITED).

The half-yearly general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Wednesday.

Mr. GEORGE W. DUMBLELL (chairman of the company) in the chair.

Mr. J. D. ROGERS (the secretary) having read the notice convening the meeting, the managers' report and accounts were taken and read.

Mr. ALLEN (the London secretary) then read the following report of the directors:—

The directors in meeting the shareholders this day have nothing wonderful to communicate, unless the continued prosperity of this great mine is truly considered a wonder amongst all the mining companies of the world. The managers show the steady and satisfactory working of the mine, and the accounts go beyond all doubt that the returns were never better. The directors at their last meeting yesterday declared the usual quarterly dividend of 3s., with a bonus of 2s., a share, payable in 14 days, and they also carried a further sum of £200, to the reserve fund, thereby increasing to over £8000, and after providing for all liabilities there is a balance of assets of over £6000. The recent failure of a large mining company will probably cause a considerable loss to our company, but the amount due to Great Laxeley is not large, and will be met by the reserve fund, and the payment of regular dividends to the shareholders. Upon the whole, the affairs of Great Laxeley were never in a more prosperous state. The additional level has been prepared for the reception of locomotive engines, which are now in the island ready to be put to work. The steamer Reliance, which was purchased by the company, has proved a very valuable assistance in delivering the ore.

March 22.—The favourable results of the past six months' working, and the continued prosperity of the mine generally, makes it a pleasing duty to submit to you our half-yearly report. We begin, as usual, with the bottom levels of the Deep Mine. During the past half-year a communication has been made in the 235 fms. level between the engine and Welch shaft, which has been completed, and enabled us to resume sinking the Welch shaft, after completing some preparatory work, and getting the engine and winding gear into the shaft, and the sinking of the shaft is now going on at a rate of 8 ft. below the 235 fms. level. In the same level, going south of engine-shaft, now driven 35 fathoms, the lode is without material change; the end is, however, now nearing a point where a lode of some promise is gone down in the 200. The section of ground between the two shafts has been regarded as dead ground, but now that the bottom levels are holed we think it desirable to cross out at one or two most likely points. The 235, north of Welch shaft, is driven 25 fathoms, and holed to No. 1 winze; the level has been passing through a lode varying in value more than we expected, which means it also applies to any way at present, where, however, the lode is not opened to its full width. When done, and a little farther from the disturbed ground caused by a small slide, we have little doubt the lode will be found less fluctuating and increasingly valuable. No. 1 winze, in the 230, has been sunk as deep as the 235, and the level driven about 3 fathoms on the lode in each direction. The whole of the lode was not carried in sinking the winze, but is sufficiently opened below and in driving the end to show its value, which is on an average about 70s. per fathom. The 230 north of the lode is holed to the 210 winze, and now 12 fathoms beyond it; here also the lode has varied in value, from comparatively poor in places to 35s. per fathom, averaging about 24s. per fathom. The end at present is worth 12s. per fathom. No. 1 stopes in the roof is worth 25s. per fathom, and No. 2 stopes 18s. per fathom. Within the past few months the work in the 210 fms. level north has been attended with greatly improved and gratifying results. The supposed branch standing to the east at the date of our last report has since been proved a very valuable reality, and has vastly changed the aspect of things in this level. A second cross-cut, about 15 fathoms south of the first, was started a short time since, and intersected the vein in 7 fms. driving, where it is 4½ ft. wide, worth for lead and blende 60s. per fm. The first cross-cut was 5 fms. only, showing a tendency to diverge southward, and we cannot yet say how far it will continue distinct from the footwall lode. There is some indication of a split taking place about 25 fms. further south, and a little north of some stope ground in the roof, and here we intend making a third opening to the hanging. Whether this proves to be it or not, the discovery is of great value, but should it not prove identical with that at the cross-cut, and that branch of the lode be found to be standing off still further south, as it so far as we have every right, that the lode is as productive, showing a tendency to diverge at these points, there is at this level over 20 fms. in length of ascertained ore ground, and so far as opened, worth on an average 65s. per fathom. The present end, going north of the first cross-cut, is worth 70s. per fathom. In a few fathoms further driving this end will reach a winze which has been sunk as deep as this level roof from the 200, in a rich lode, averaging in value about 50s. per fathom. This communication is just now much wanted for ventilation, the only means at present being an air machine worked by hand. Southward a stope in sole of this level is about 20s. per fathom. The forebore of the 200 north must now be within a short distance of the slide in Dumbell's, and seems to be passing the point where the western part of the lode joins the other. There is, as at any rate, a great width of lode going back on the lying or footwall side, a little from the end, and, going northward, is altogether to the hanging or east of the present end, and therefore we are unable to give the value at the extreme forebore, but at the point of junction it is worth 55s. per fathom. The two stopes in roof are worth 40s. and 50s. per fathom respectively. We must here remark that these stopes have not yielded more ore as they offered to do when driving the level, the lode contracting or getting narrower for some distance along the roof, but widening towards the sole, where we expect the lode will be quite as valuable, and perhaps more so, as reported from time to time of the level when driving through. No. 3 stopes in roof











## FOREIGN MINING AND METALLURGY.

The aspect of the French iron trade may be described as neither good nor bad. There is a good deal of work on some sides, but there is too little available in other directions. The market is badly balanced, upon the whole, but still it is sustained, and if prices would but revive a little there would not be much to complain of. It is comparatively small matters that an improvement is noticeable; thus there has been rather more doing in worked iron, while the blast-furnaces do not present any increase of activity. At Paris, the blast-furnaces in progress, iron for construction purposes is in rather good demand; first-class is quoted at 77. 12s. per ton, and heavy plates at 107. per ton. The question of the renewal of treaties is now in hand; the three commissaries appointed to deal with the subject are MM. Amé, Ozenne, and Léonce de Lavergne. A committee of consultation has also been deputed to assist the commissaries; this committee will probably be composed of MM. Pouyer-Quertier and Ferry, senators; and MM. Balson, Reverchon, and Jullien, members of the Superior Council of Commerce.

The quantity of coal imported into Belgium in the first two months of this year is officially returned at 107,000 tons, as compared with 122,000 tons in the corresponding period of 1876, and 105,000 tons in the corresponding period of 1875. The imports will be seen to exhibit, upon the whole, little change. The imports of coke into Belgium in the first two months of this year were 4000 tons, as compared with 3500 tons in the corresponding period of 1876, and 4000 tons of coke imported by Belgium in the first two months of this year 3335 tons came from Prussia, and the remainder from France. The exports of coal from Belgium show a marked decline; they amounted to February 28 to only 409,000 tons, as compared with 603,000 tons in the corresponding period of 1876, and 561,000 tons in the corresponding period of 1875. The exports of coke from Belgium have also fallen off, having receded to 82,000 tons in the first two months of this year, as compared with 92,000 tons in the corresponding period of 1876, and 96,000 tons in the corresponding period of 1875. The decline observable in the exports of coal and coke from Belgium is attributed to the increase of foreign competition; and hence there has arisen a cry for navigation reforms, to which the Belgian Government must give attention if it wishes to preserve one of the finest industries of Belgium—coal mining.

Chilian copper in bars, with delivery at Havre, has made 76l. per ton at Paris; ditto, ordinary descriptions, 73l.; ditto, in ingots, 77l.; and ditto, English tough cake, 77l. per ton. As regards tin, it may be added that Banca has been quoted at Paris at 77l. per ton, with delivery at Havre or Paris; Billiton has made 76l. per ton; and Straits, 76l. 16s. per ton. The quotation for Banca tin at Rotterdam has been 424 fls. to 423 fls., while Billiton has brought 424 fls. to 423 fls. French lead, delivered at Paris, has made 21l. per ton; Spanish ditto, delivered at Havre, 20l. 16s.; English ditto, 20l. 16s.; and Belgian and German, delivered at Paris, 20l. 16s. per ton. Silesian zinc, delivered at Havre, has realised 21l. 16s. per ton at Paris. Other good marks, delivered at Havre, have made a similar price. At Marseilles, Vieille Montagne zinc in sheets has made 30l. 16s. per ton.

Prices continue to show feebleness in the Belgian iron trade; work is not absolutely wanted, but it is not obtained upon remunerative conditions. The *cabier des charges* of a transaction in which 13,875 tons of iron rails are to be delivered at Pernambuco, Brazil, is also very severe, the firm contracting to supply the rails guaranteeing them for a term of four years. Mechanically forged horse-shoes, on Sibit's patent, are being introduced into Belgium, a Verviers firm having purchased the privilege of manufacturing them. M. Victor Dumont, of Louvroil, and M. Bovequand, of La Louvière, have made similar arrangements. A trial of the Potelet system of iron sleepers is about to be made on a short piece of line uniting the Mariemont collieries with the Belgian State railways. Official Belgian returns show that the exports of rails from Belgium increased in the first two months of this year; the exports of plates, however, experienced some falling off. The John Cockerill Company has obtained an order for 5000 tons of steel rails for a line in Spain. The last few days have presented few encouraging circumstances in connection with the French coal trade. The supplies left on hand from the winter appear to be rather heavy, so that no improvement in quotations appears to be possible before the commencement of the winter of 1877-8; most of the colliery proprietors have recognised this fact. A fall is, however, little probable, and indeed almost impossible, as prices have already fallen to a point at which concessions can be no longer made. In the Nord and the Pas-de-Calais some rather large transactions are anticipated, but they are not likely to materially modify the situation. In the basin of the Loire deliveries are rather showing increased weakness, but the state of the market remains, upon the whole, nearly the same. Unless the concessionaires of certain mines in the department of the Nord resume working operations by April 22 their concessions will become forfeited, in terms of a recent prefectural decree.

## AUSTRALIAN MINES.

BURRA BURRA.—Capt. Sanders, Feb. 17: I beg to state I have let Morphet's engine shaft to 12 men to sink from the 85 to the 100, cut ground for plat, put in 20 ft. of shaft, and sink in same, and complete the whole to the 100, keep present part of shaft and pitwork in repair. Gravel's engine shaft, to sink from the 50 to the 60, by nine men. The 85 ft. level south, on Sanders's side, to six men, at 15l. per fathom; lode producing purple and grey ore, and malleable copper. The 85 fathom level north, on same lode, to six men, at 16l. per fathom; lode producing purple and grey ore. The whole of the stuff from these ends is saving work for dressing, and looks promising indeed, the best of the ore being towards and in bottom of drive; this is encouraging for the deeper levels. Two men are engaged in putting in new dam in the 70, and two cutting ground in same level under Waterhouse's shaft, so to facilitate the communication. Six men cross cutting through Sanders's lode at the 60.—Peacock's Air-shaft: This will be continued through this lode and across Kingston's lode, as the latter has not been seen between Waterhouse's and Peacock's main shaft below the 20. In this cross cut they are now breaking some stones of rich purple and grey ore. Our open work is being pushed on with all possible dispatch. The engines and machinery are in good order, and working well.

PORT PHILLIP AND COLONIAL (Gold).—The following advices, dated Feb. 20, have been received:—Quantity of quartz crushed for the four weeks ending Jan. 31 1865 tons; pyrites treated 22½ tons; total gold obtained, 418 ozs. 16 dwts. or an average per ton of 5 dwts. 13½ grs.; receipts (including amount obtained from tributors and return of royalty), 3297l. 9s. 9d.; payments (including 633l. paid for firewood, timber, and other extra items), 2531l. 3s. 1d.; profit, 766l. 6s. 8d.; which, added to last month's balance of 2061l. 1s. 1d., made an available balance of 2272l. 7s. 8d. The amount divided between the two companies was 800l., the Port Phillip Company's proportion of which is 520l. The balance of 2072l. 7s. 8d. was carried forward to next month's account.

—The following telegram has been received, dated Melbourne the 8th inst.:—Month ending March 28, yield per ton 7 dwts. 17 grs.; western reef, No. 10 level, 5 dwts. 18 grs. per ton; profit, 1698l.; remittance, 1000l.

SCOTTISH AUSTRALIAN.—The directors have received advices from Sydney, dated Feb. 17, with reports from the Lambton Colliery to the 13th of that month. The sales of coal for the month of January amounted to 11,958 tons.

ENGLISH AND AUSTRALIAN (Copper).—Port Adelaide, Feb. 24: The stock of coal at Port Adelaide works was 2065 tons. The smelting operations, both at Port Adelaide and at Newcastle, were proceeding satisfactorily. Since date of last advices further shipments of 200 tons copper had been made.

YORK PENINSULA.—The directors have received advices from the committee of inspection of the company at Adelaide, dated Feb. 22, with reports from the Kurilla Mine to the 19th of that month. The following are extracts from Capt. Anthony's report:—Kurilla Lode: At the 45, east of Hall's shaft, rich stones of ore have occurred at every foot since my last report, but not in such quantity as I then hoped, although I do not remember having seen a more promising lode anywhere; and the winze, about 2 fms. east of, and 2 fms. above the end of the 45, has a good lode in it. Should the lode continue to be soft we shall not be long in reaching the second or main run of ore at the 35. The lode in the 35 winze, as above noticed, holds good, and when holed will have some good tribute ground. I have begun to enlarge the 45 level pit at Hall's shaft, previously to driving west towards Grainger's shaft. I may remark here that the cross-course at the 45, east of Hall's, is so distinct, and the ground so soft, that it would be an economic measure to drive thence to Morphet's lode, and drain it by Hall's engine. The distance to drive would be (say) 30 fms.—Morphet's Lode: The shaft is 14 ft. below the 20, and the shaftmen are now driving the 20 east and west of the shaft. At the beginning of March these men will resume sinking, and other men will replace them in the driving; each end is laying open tribute ground that will work at an average of 6s. 8d. in 12. The 10 is driving west, on the north branch of the lode, and is laying open tribute ground of about 10 ft. in 12.—Tribute Works: There are throughout the mine 32 men working on ore, said in my last to be awaiting sampling, producing net 922l. Ore on hand, 670 tons. I shall prepare another 100 tons of ore for sampling as soon as the lode is not yet sufficient to put the engine to work for yet it will be worth while to work it (say) eight hours per day to wind from Morphet's and the hauling shafts, which it is my intention to do without any more delay than is necessary.—Au-

thony's Lode: As soon as the hauling shaft is down to the 45 I would advise that we drive on the cross-course at that level, so as to intersect it 20 fms. deeper. I have every confidence in the value of the lods.

## FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, April 11, and Morro Velho, April 5: Produce for the month of March, 29,000 cts. = 11,377l.; yield, 5-2 cts. per ton. All going on well.

DON PEDRO.—Capt. Vivian, March 4: The produce for February amounts to 3222 cts. The produce is comparatively small, being a short month. The force limited for breaking ores, consequently the output was 700 tons less than for January. However, I am pleased to state that we have now a fair prospect of increasing the force.

Mine Captain's Letter dated February 28: The ores have been extracted from the following places:—Nos. 5, 6, and 8 shoots. General work is again of a moderate rate quality, but no boxwork available. On the 24th we resumed the No. 6 shoot in No. 8 shoot. From the northern part of the said stope the lode has made a sudden dip north towards the No. 7. Good samples have been obtained, and we believe that good results will follow from these said stopes. In the No. 4 stope the lode is very large, and of a good quality. From the present breast of the said stope to the footwall of No. 6 shoot above there is about 5 ft. of ground standing between the two shoots of the lode, which will pay to take away. It is very clear to us by extending the No. 4 stope in No. 8 stope one or two sets further it will embrace the northern part of No. 6 shoot, when good results are expected. Nos. 5 and 6 shoots at the horizon of Alice's are being continued satisfactorily considering the force.—Drainage: The water drawn from the mine is the same as when last reported on. The re-opening of the incline shaft is being continued as fast as possible. On the 26th we fixed a new horizontal roll in place of the old one at the bottom of the vertical shaft.—Prospective and Running Work: In consequence of so much rain, which has damaged the roads to a great extent, the carriers are not able to bring in timber for work connected with the permanent pumping machinery, therefore progress is rather slow. The new level driving towards Vivian's shaft from the No. 1 side is progressing satisfactorily. Four sets of timber are being fixed in No. 1 side level adit. Six sets of timber are being fixed in Alice's level, near No. 6 shoot. The re-opening of the No. 3 cross cut is being continued. The new level at this horizon, going towards the canoa, is being continued, and all the other running work is kept on.

Mine Captain's Letter, dated March 10: The ores that have been extracted from the following places:—Nos. 5, 6, and 8 shoots. General work is of a moderate rate quality. No boxwork available.—Stopping: Stopping operations on No. 5 and 6 shoots at the horizon of Alice's; the lodes have been very fluctuating for the last few days, and general work from same low in quality. The No. 1 stope east, on No. 6 shoot, is suspended, as it is necessary to leave it for the present in consequence of Alice's level. We have again resumed the Nos. 3 and 5 stopes in No. 8 shoot, where we hope to increase the returns. The No. 4 stope has been under suspension for the last eight days waiting for the advancement of the No. 3 stope. Nos. 6 and 7 stopes have been continued without change.—Drainage: Water drawn from the mine is 22-50 cubic ft. per minute, and with what they were under the 35, is suspended for a few days in consequence of not having sufficient timber of proper quality for fixing the set. The force is removed from the same, and re-commenced sinking until such a time as timber comes in. The carriers have again commenced bringing in timber, and we hope all work connected with permanent pumping machinery will be resumed.—Prospective and Running Work: The repairing of Vivian's shaft being kept on when convenient for force. Repairing of Alice's level being continued. The driving from the No. 3 cross cut towards the canoa being kept on, also the driving towards Vivian's shaft from adit level. Timber for set to carry rolls P. P. M. being fully supplied from company's stores. Preparations are making to fix bob at the entrance of adit level, and all other work connected with P. P. M. being continued as fast as force will allow us.

—Copy of telegram from Rio, dated April 11: Produce for the month (March) 4350 cts.

SANTA BARBARA.—Mr. Hilleke (Paris), Feb. 24: Since my last advices no more damage has been done to the regos; the weather cleared up on the 17th inst., when we were set to work to open the regos between Nos. 1 and 2 stamping mills by closely timbering the part which is crushed by the start of the mountain. The work was still in hand when a further motion of the mountain took place, and dislocated and crushed every piece of timber, causing the whole to run together again. The only way left to make the repairs here is to build launders off from this place, of about 250 ft. long by 3 ft. wide, to carry the water from No. 2 to No. 1 stamp. These launders are now in hand, and every diligence is being used to get them in readiness, as the amalgam barrels cannot possibly be worked before their completion. The movement of the mountain also extended to and is visible at No. 1 rego, near No. 2 stamps, where several large cracks have appeared, crossing the rego; however, I do not think that this place will give us so much work as the other, and if the weather continues favourable I hope by March 12 to have the repairs so far completed that Nos. 1 and 2 stamps can be again set to work; we shall then be stamping with 48 heads, and be able to treat at least the usual quantity of ore. No notable changes have taken place in the appearance of the lode since last reported on, in the mine, so far as boring is concerned, going on as usual, and the ore is accumulating. The water has increased in the mine since the heavy rain set in, and extra force is required to keep the same in fork. The prices of provisions are going up very much, entirely owing to the fearful state the roads are in, in which likewise has decided me not to run the risk of sending the gold trod to Rio in March, especially as I have only the produce of January to forward.

PITANGUI (Gold).—The directors of the Pitangui Gold Mining Company (Limited) have received the usual monthly advices from Mr. Hilleke, dated Paris, March 12. Fair duty has been done towards the driving of the adit, which has been extended 5 fms. during February; the rock for this distance was a little more favourable for boring than in January, but the ground was still very changeable, and the adit again in hard rock. Total length of adit driven from mouth of same at Feb. 28, 48 fms. 5 ft.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada: Week's run, 833,000; week's produce of refinery, \$30,000.

BIRDSEYE CREEK.—Telegram from Mr. G. S. Powers: We have cleaned up after a run of 30 days. Gross returns, \$7250; profit, \$2250.

NEW ZEALAND KAPANGA.—Telegram from Capt. J. Thomas: Since last message we have raised 15 tons of ore; have sunk winze under No. 5 level 40 feet, and commenced to drive south at No. 6 level, and have driven No. 5 level towards the Albion shaft of gold 70 ft.

ARGENTINE.—Telegram, dated Buenos Ayres, April 9: Twenty days stamping, 500 tons treated (partially treated only, pending erection of calciner), 175 cts.

PANTULILLO.—F. G. Welch, Alto, March 3: The production amounts to 32,000 quintals metric, at 6½ per cent. A short month and continued bad state of backs in the north stope Mina Vieja have prevented a better output.

CONDOS DE CILLI.—Mr. James Secombe, March 2: The mines generally are looking up, and what they have ever done, compared with what they were looking up, and what they are doing now, is much better. Most of the points of exploration then were poor, and now they are rich. I am very hopeful that I shall soon have the pleasure of telegraphing a lode being cut in the deep adit.

—Mr. Secombe (March 2) writes that he dispatched the following telegram, which has, however, never come to hand:—"10 tons of regulus and 12 tons of raw ores have been shipped per Iberia; 5 tons of regulus and 45 tons of raw ores have been shipped per Illimani." The ores and regulus referred to have duly arrived.

The following telegrams referring to a later date than the foregoing report have been received:—On March 19 (dated Valparaiso, March 17): "16 tons of regulus and 35 tons of raw ore have been shipped per Britannia. Isolina Mine, Batters' (old workings), operations progressing satisfactorily; completed the shaft to the bottom of the mine; lode in bottom averaging—estimated value per ton (query per fathom)—1000. Isolina Mine, Dawson's (new workings), lode maintaining its value going down; estimated value, 70l. per fathom." On April 7 (dated Valparaiso, April 5): "14 tons of regulus and 25 tons of raw ore have been shipped per steamer Valparaiso. Operations progressing satisfactorily."

CHONALLES.—The directors have received advices from their manager, dated March 5, who reports: The mill has worked very satisfactorily during the past month, and has crushed 750 tons of quartz, giving an average of 4 dwts. per ton, equal to 150 cts. We value the gold at 4 ½; our cost for the month has been 416l., showing a loss of 11l. The above cost includes the sum of 25l. charged to construction account. The prospects of the mine have improved by the discovery of extensive manta at San Sebastian and East San Benito. The manager adds:—From the experience I have had with the other lodes here, I believe this latter mine will prove of greater value than most of the mines I have worked here, and, profitable mine than this company has yet developed.

JAVALL.—The directors are in receipt of advices from their manager, Capt. Sohns, dated March 6. The mill driven by the steam-engine worked 20 days, and crushed 1550 tons of quartz, which yielded 442 cts. of bullion. The remittance is valued at 1130l., and the cost, including 116l. on capital account and 160l. paid for fuel, was 934l. The dry weather still continues. The tailing mill is completed, but was not worked in consequence of the short supply of water.

BLUE TEND.—D. T. Hughes, March 17: There has been another favourable week for free water; unwatched full time in South Yuba, except one day in clearing up the flame in the tunnel. The result is quite encouraging, which you will learn before this reaches you. We shall clean up the undercurrents and lower sluices next week, and our prospects are favourable for our next run to be also a profitable one. In the Enterprise we continue to wash every hour possible both day and night, but have been much annoyed during the whole week by large masses of pipe-clay and mud sliding down on us from above, interrupting our washing at various times, but we are in hopes that by the middle of next week we will be through the worst part of it.

CEBAR CREEK.—T. B. Ludlum, March 18: Since my last we have had several days heavy rain, filling our ditches with water to their full capacity. The Baker claim is being worked with vigour, yet owing to the narrowness of our pit our progress is slow; we are, however, using every available means to increase the size of our opening, and hope that we will soon have it of sufficient size to enable us to work to advantage. We have not yet exploded the blasts on the north of the pit, but are now preparing to do so. This has been deferred, owing to the necessity of cutting down the intervening between the pit and the shaft, so as to wash directly into the shaft, as the blasts will close up and crush our incline. We made a partial clean-up on the 14th inst., realising about \$2300, which added to former partial clean-up aggregates about \$1000; we have used water in all equal to 14-7-10ths days of 24 hours each, being an average of \$551 for each day's water. With the exception of a very small space, all our washing has been done on drifted ground. The former owner informs me that within the area that we have washed off our predecessors took out over \$20,000, which statement is confirmed, and ex-cited by others who worked therein. We are so situated that we cannot drive the gold into our sluices, but must content ourselves to let it remain on the north-west side of the pit until we can cut a direct channel through to the shaft, as our sluices are on a ridge of bedrock, which is higher than on either side. The Star and Union claim continues washing pay gravel, and is working well. The Pacific and Central claim have both been cleaned up since my last, but we are not yet in receipt of the certificate. The former has resumed washing, and is running day and night. As we now have no surplus water I have concluded not to wash in the latter at present.—Water Sales: Our customers continue taking a full supply.

L. L. Lewis Chalmers, March 19: I am now busy getting the hoister I bought overhauled and erected, when I commence sinking to the 400. My foreman reports: "The north drift is now in 525 ft. from cross-cut on 200 ft. level, 6 ft. in. driven this week. This drift is in a well-defined ledge 4 ft. thick, and is running 20° west of north, pitching 55°: 3 ft. 6 in. of solid quartz at face, which is looking a deal like the quartz of old upper tunnel; considerable water coming. The raise is now 160 ft. from drift, 12 ft. having been driven this week, and is

in fine ledge matter going along the hanging wall. The footwall we have not seen for over 100 ft. The ledge is apparently big. The Ophir ledge on the 200 ft. level is looking well. The engine has been taken to pieces, and hauled to the I. X. L. hoisting works. The foundation timbers are all ready.

EXCHEQUER (Gold and Silver).—L. Chalmers, March 19: I am now running my new hoisting rig. At last I am able to announce that I started the mill on Saturday, and that the furnace is also in full blast. I am also able to inform you that with the exception of one pan and one settler, which are not quite tight, everything runs beautifully. In order to fill up ore-crives and grind the new shoes and dies of the pan I am running on low grade ore. The tests for the furnace for which we are preparing will be made on first-class ore in a few days. I cable you today as follows:—Started mill and furnace on Saturday, all running well. I think I have succeeded in getting an A1 mill foreman.

The foreman reports, March 17: No. 2 stope, on the 100 foot level, was driven 9 ft.; vein 2½ ft. of No. 1 ore and 2 ft. of mixed ore. No. 1 stope, on the 200 ft. level, was driven 22 ft.; vein 23 in., and 2 ft. mixed with first-class ore. No. 2 stope, in the 300, was driven 12 ft.; vein 2 to 5 ft., 1 ft. good ore. The 400 drift was driven 6 ft., and two sets of timber put in vein 2 to 3 ft., with good ore. The Accacia Tunnel was driven 4 ft. Everything looks well in the mine. There will be no trouble to keep the mill running.

Mr. Chalmers (March 21) writes:—To-morrow we finish running on low-grade ore, which was advisable to smooth pan shoes and dies, and get the rough off the furnace. After to-morrow we shall commence making the furnace fire, and I hope to be able to furnish you with cheering results. I am afraid I shall not be able to furnish the annual report you wish, but will try.

BRITANNY MINERALS.—John Edwards, April 7: The lode in the sump-winze is worth for the length of shaft 90l. per fathom for silver-lead ore. The lode in the 70 driving south from sump: 2 ft. wide, worth 30l. per fathom; the ground driven during the week is 3 ft. The lode in this level driving north from sump is 2½ ft. wide, and worth from 35l. to 40l. per fathom, and the water still increasing as we near the counter lode; ground driven during the week 4 ft. At the Rouex we have sunk the engine-shaft during the past week 3 ft. 6 in. in the lode is 5 ft. wide, carrying good stones of silver-lead ore throughout; this lode is of a splendid appearance. The machinery is working well.

LUSITANIAN.—April 3: Palhal Mine: The lode is still worth 5 tons of ore per fathom in the bottom of Taylor's engine-shaft below the 190. The 50 cross-cut, north of Perez shaft, has not yet intersected any lode, and the ground in the end is very hard. A winze (No. 108) below the 25, east of River shaft, is being sunk in a lode worth ½ ton of ore per fathom. Winze No. 107 is going down in the bottom of the 150, west of Taylor's shaft and west of the slide, where the lode is producing 1 ton of ore per fathom. In the 190, west of Taylor's shaft, on Basto's lode, the lode is at present yielding ½ ton of ore per fathom. In the 180, west of the slide, the north part of the lode upon which we are driving is still disordered. In the 170 west the lode in the south side is like the floor of the mill lode, in the north side like Basto's lode, while the middle part resembles the slide; it is unproductive at present. The lode in the 150, west of the slide, is 1 ft. wide, composed of quartz, with good stones of ore in the upper part of the end. The lode in the 140, east of River shaft, is producing ½ ton of argentiferous lead ore per fathom. The lode in the 70 east is composed of flooken and country, with spots of lead. In the 50 east the lode is worth ½ ton of copper ore per fathom. In the 25 east the lode is looking a little better, and giving out some water. Winze No. 108 below the 180, west of the western junction of Basto's lode and the slide on the south part, is producing 1 ton of ore per fathom.—Carvalho: In the 60, west of cross-cut south of incline shaft, the lode is small and unproductive. In the 30, north of the great lode, and west of the incline shaft, the lode is 8 in. wide, containing good blende.

W. H. Rickard, April 2: Monthly Report: Roure: The sinking of the engine-shaft below the 150 metre level goes on rather slowly. The 100 cross-cut, towards Virginie's lode, continues in hard ground, consequently our progress is slow. The 80 metre level north is in a kindly lode, yielding a little saving work, but the same level south is poor. The 60 metre level north, on Virginie's lode, yields a little ore; the lode is rather disordered. The same level north of Brugere's winze is poor. The main part of the lode appears to be to the west of the level, and we intend to drive into it. The 40, north of the same point, is in a kindly lode, and we are entering the productive ground. The 20, through in the level above. The adit on Virginie's lode has been holed to the same level south of rise. We have set to drive this level on the western split of the lode south of its junction with the main lode, where it produces ½ ton of ore per current metre.—La Brousse: The 140 metre level, south of Basset's shaft, yields saving work of low quality. The 120 south is entered good ground, worth 1 ton of ore per current metre. The 80, where being under behind this end, yields 1½ ton of ore per current metre for its full width. The 100 cross-cut, towards the air-shaft, has been driven through the western part of the lode, which is 2 metres wide of good ore stuff, worth ½ ton per current metre. The air shaft below the 80, over the latter named point, being sunk in favourable ground. The sinking of the new engine-shaft from surface continues to be hindered by the effects of the rain. The weather being now fairer we hope to make better progress. The 120 cross-cut is under this point, ready to begin rising. In the 60 we have begun to rise by a full pace, and hope to make good progress.—Pranal: The sinking of St. George's shaft below the 90 goes on well, and we hope to complete it to the necessary depth for the 100 metre level this month. The 50 metre level north yields a little ore, but is still very good; it passed through 10 ft. of splendid ground, the lode in the 70 east is in a kindly lode, and we are entering the productive ground in the south part of the lode. We shall only cut into the productive part when we have holed this level to the winzehead, in which we have fixed the air pipes, so as to have a more thorough ventilation, the gas being very strong about this place. The 70 north yields 1 ton of ore per current metre. No. 5 winze, below the 70, yields ½ ton of ore per metre. The 70 south yields ½ ton, and the 50 south ½ ton per metre. We have suspended the 30, north of St. George's, to sink a winze which will open productive ground, and ventilate the level below.—Surf: The fine weather being now fairer we hope to make better progress. The engine-house at Roure and shall shortly begin at La Brousse. Our dressing has gone on regularly, and the samplings have amounted to 232 tons.

For remainder of Foreign Mines, see to day's Journal.]

## LANZI (TUSCANY) LEAD MINES—SPECIAL REPORT.

April 5.—The ore was sent to Messrs. Dilwyn and Co., Swansea, by sailing vessel according to instructions; it left Genoa March 1. I think sailing vessels take six weeks to get to England. I have written to the agents at Genoa to know if the vessel was going direct. All the drives in the lode are in paying ground; No. 6 has been driven, but is still very good; it passed through 10 ft. of splendid ground, more than three-fourths was clean ore. Both the vessels with the machinery have arrived; the first lot is already at San Vincenzo. I shall get the crusher to the mine to-morrow. We wait further preparations till Mr. Edwards comes. I received analysis of small cargo of what I call poor ore; I was pleased to know it is better than expected—22 per cent. zinc, 20 per cent. lead, and 9 ozs. of silver.—JAMES SIMKIN.

Lead Quarry Lode: No. 1 cross-cut in the lode is just the same as reported last time, paying ground. No. 4 drive opening ground for lead and blende. No. 6 drive, in paying ground. No. 1 drive, south side of No. 1, cross-cut, is in paying ground. No. 2 stope, north side of No. 1, is just the same—in paying ground. No. 4 stope, south side of No. 1, is very much of the same quality. We have now timbered the shaft from the 13 ft. level to the marble adit to keep the ladder-road safe in throwing the leadstuff down the shaft.—King's Lode: The top piece of shaft in the arch of ground is just the same for breaking; will soon be communicated with the bottom shaft.—JOHN BOYNS.

The Lead Quarry Lode is so named from the fact that it comes to the surface, and is 60 to 80 ft. wide; some portion of it has been quarried out. On the floor of the quarry the company commenced sinking in the body of this immense lode, and have driven an adit in the marble about 200 yards in the side of the hill, which is now communicated with the shaft at a depth of 50 yards; the ore from the levels is thrown down this shaft, and is taken by tram along the adit straight to where the dressing-floors are being prepared. A metallurgical engineer who inspected the property speaks of this lode as follows:—"The lead lode called the Cava Plombo is situated on the north-western side of the property, at an elevation of 1000 feet above the sea level. This lode has been worked as a quarry or open cutting; it is nearly 100 ft. wide, consisting of masses of amphibole, with lead or blende, or both permeating throughout, sometimes in the most intimate subdivision, sometimes in large strings of lead and blende mixed together, or separate. It would, in my opinion, be quite impossible to calculate the percentage of mineral through the entire face of this most extraordinary lode; every blast made varied the quality, but as to quantity there is practically no limit. I believe that at a very little cost, by opening 50 or 100 tons daily of lead and blende ore might be produced from the quarry. As the workings get deeper it is my opinion that the amphibole will run smaller globular masses, and the mineral will become of more regular and higher percentage."

A mining engineer who has since inspected says:—"There is a vast quarry upwards of 200 ft. high, and more than 80 ft. wide, by 30 to 40 ft. deep, the entire contents being the leadstuff; contains the lead and blende ore in patches and spots, and so thickly are these distributed that it is next to impossible to break a portion of the lode without discovering one or both of these minerals in an almost pure state; but they are so intimately mixed that careful separation becomes necessary. The contents of the lode are crystallized actinolite, iron pyrites, blende, and lead. The appearance of the quartz is peculiar, it needs only be said any conceivable amount may be blasted, the only limit being the means employed."

TABLES FOR MECHANICAL ENGINEERS.—The necessity for absolute accuracy in connection with estimates for engineering works renders reliable tables of perhaps greater utility to engineers than to those engaged in any other professional pursuit, and from the completeness of the series forming the "Manual of Rules, Tables, and Data for Mechanical Engineers," by Mr. D. K. Clark, M.I.C.E., just published by Messrs. Blackie and Son, of Paternoster Buildings, the labour of making estimates in the future may be materially reduced. From Mr. Clark's experience with the profession few could be found better able to determine the probable requirements of those for whom the volume is prepared, and the character of the work will be appreciated when it is stated that the information given is based on the most recent investigation, and that it is such as will be of constant use in calculations and estimates relating to strength of materials, and of elementary constructions, labour, heat and its applications, steam and its properties, combustion and fuels, steam, hot air and gas engines, air and water machines, mill-gearing, friction, &c. In the section on weights and measures, the weight volume and relations of water and air as standard of measure are concisely set forth. The conversion of French quantities at French prices into English quantities at English prices is carefully given. In the section on the strength of materials a vast amount of entirely new matter is introduced, and a large number of experimental results recorded. On the subject of mill gearing a new and compact table of the pitch, number of teeth, and diameter of toothed wheels is given, and what will be of particular interest to the readers of the *Mining Journal* there is an admirable section on the principles of air-compressing machines and compressed air-engines—a branch of mechanical practice of comparatively recent origin—accompanied by convenient formulae and tables. The volume as a whole will prove invaluable to engineers, and in the labour saved will repay its cost in a few weeks.

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## MACHINE v. HAND LABOUR IN MINING.

BY SIR G. W. DENYS, BART.

The comparative saving of time and money by the substitution of machine for hand labour in lead mining is a subject of such paramount importance to the mining interest that it is scarcely necessary for me to apologise for thus thrusting myself before the public in print, or to crave the indulgent criticism of my brethren of the "Pick and Gad," for any literary defects this paper may contain; my object being solely to give them the benefit of my seven years' experience in level driving by machinery, upon the conclusion of a work which will, I trust, afford ample occupation for the skilful miners of this valley for generations to come.

In order to save the time of those who may not have patience to read my story, I will, before commencing it, answer the question every miner is certain to ask at the outset—Does boring by machinery pay? I answer decidedly, yes, wherever you have plenty of water power, and a long distance to go. I do not hesitate to affirm that I have driven 550 fms. with the borer in one-third of the time, and for half the money it would have cost to drive the same distance by ordinary hand labour. I am, indeed, almost afraid to hazard an opinion as to what it would have cost to drive by hand labour, for at bottom I do not believe it could or would have been driven at all. Further, wherever extensive mining operations are intended, whether machine drills are to be used or not, an air compressor put up at the commencement will pay for itself five or six times over.

It is believed that several lead mines in North Yorkshire have been worked ever since the time of the Romans. I have myself seen at Ripley Castle a pig of lead with the Roman Emperor's mark on it; be that, however, as it may, few can give any idea when the "old man," as he is called, first broke ground. Shafts were sunk from the surface, and drifts driven from the foot of these old sumps long before the invention of gunpowder. Levels driven horizontally are comparatively a modern invention, and clever as the "old man" undoubtedly was, it has always struck me as very extraordinary that he should for such a length of time never have thought of making use of our transverse valleys as natural cross-cuts and drains, from whence he might have put in his drifts and taken the principal veins by the end. But fortunately he did not know everything, or there would have been nothing left for us. Levels at length came into fashion, perhaps 80 to 100 years ago; I do not know exactly when. The main or 12 ft. lime appears to have been the only stratum much thought of, and all the levels were at first driven for the purpose of proving the veins in the main lime. Afterwards the black and red beds were looked into and ransacked, and finally the underset lime. This system has now been going on for 60 or 70 years, and it has long been evident that unless efforts were made to get into and prove the veins lower down in the strata than the underset lime, it would not be long before many of the old mines would be worked out. There was, however, a general local prejudice against the productiveness of the veins deeper down, and it was not until after trials had been made in Wensleydale, and the veins proved to be metalliferous, that our people began to think at all about them.

It was not at all surprising that the generality of lessees should be loth to undertake works that would require 10 or even 20 years to complete, for the deeper you want to get down into the strata the further, generally speaking, you have to go down bank from your vein before you can commence your drift. At length in July, 1864, the Old Gang Company, on the east side of Gunnerside Beck, and the Blackthwaite Company on the west side, agreed to start at their joint expense the Sir Francis Level, sufficiently low to prove the great east and west veins of Friarfold and Old Rake in the fourth, fifth, and sixth lime. To carry out this object they had to commence about 750 fms. from the line of Friarfold vein, and close to the boundary line between the two companies. In January, 1867, the latter company came to an end, and the work thence forward up to January, 1870, was carried on by the Old Gang Company only. Up to Dec. 31, 1866, that is in two years and six months, 143 fms. 4 ft. had been completed. At first it had gone at a nice easy price, but in December, 1866, it was going at 8d. 5s. per fathom. In July, 1869, that is in about 2½ years more, they had completed 202 fms., and the price had gone up to 10d. per fathom during the interval, and was in July, 1869, going at 8d. 10s., without counting the cost of blowing the air, and the speed was reduced to 10 ft. per month. It was becoming evident that with about 550 fms. still to drive, the lessees would never live to see the end of it.

Under these circumstances I represented to the company the desirability of bringing the science of the 19th century to the aid of our old jog-trot notions, and urged the adoption of one or other of the many boring machines that have been brought out since the Mont Cenis Tunnel was first started. New habits and customs are, however, not easy to introduce into Swaledale. We are still trailing our produce along the road at two miles per hour, with our broken-winded old screws and rotten old carts, when we might have had a railway up the valley ten if not twelve years ago. As in the case of the railway so in this, cold water in plenty was thrown on the scheme, it was too soon, it was too risky, it would be better to let somebody else try it first, &c. However, I was keen about it, and went down into Cornwall, where one or two of these machines were on trial, and came back much impressed with the merits of one which then went by the name of "General Haupt," eventually brought out and perfected by Messrs. J. A. McKean and Taylor. I thought they had got hold of the right thing, which, although then incomplete, I felt would in a little time satisfy all my desires. Subsequently I went to Greenock, to see the same machine at work in a tunnel making for the conveyance of water to the town. On this occasion, an engineer and my mining agent accompanied me, the result was that I made up my mind to stand or fall with J. A. McKean and Co.

The Old Gang Company, however, were not to be induced by all my arguments to make the venture, they would not have it at any price, and thus I became "a contractor." The terms agreed upon were these: The Old Gang Company were to build the engine-house, and make the water-course, to find rails, pipes, timber, sleepers, and everything else usually found by the masters in bargains with ordinary miners, and were to pay me 8d. 10s. per fathom for 550 fms., up to Friarfold Vein, be it more or less.

On my part I agreed—first, to pay one-fifth part of the expense of driving the said level myself on behalf of the west or Blackthwaite side. (This was, no doubt, a great inducement to the Old Gang Company to continue the level. On the other hand, I expected and eventually did get repaid for my outlay when the A. D. Company was formed.) Secondly, I had to find all the machinery of every description, and as many borers as were necessary. The total cost of this outlay, including six borers, amounted to 1321. 10s. Messrs. P. and W. McLellan, of Glasgow, furnished the McKean borers. The motive power was water, brought to bear upon a wheel 36 ft. in diameter, and 4 ft. wide, attached to one of Low's improved double cylinder air compressors of high-pressure, with a wrought-iron receiver and connections, made by E. R. and W. Turner, of Ipswich, which worked up to about 60 lbs. pressure to the inch. Upon the whole it has done its work well.

By the end of January, 1870, all was in readiness for the start, and my engineer was in command. This was a mistake. A man may be an excellent engineer, a good machinist, and quite competent to teach the men how to use the borers, but it did not follow that he knew anything about mining, as I soon found out to my cost. His first essay, even at his own trade, was unfortunate; he was nine hours before he could get the borer to rotate. To be a good architect it is not enough to be a good drawer of designs, he must understand the practical everyday work of the house-carpenter and mason, or his work will not stand. To be a good mining agent it is not sufficient to have attended Prof. Warrington Smyth's able lectures at the School of Mines, he must be a practical miner himself, and have learnt his trade at the pick's point, or he will be the laughing-stock instead of the guide of the men under him. So it turned out with my engineer; he bored one day seven machine holes, fired them seven times each, using a quarter barrel of powder, without getting a hand-barrow full of stuff by the operation. The men, of course, laughed, but when it came to my ears I naturally looked very blue, and as soon as the men had learned how to use

the machines I speedily parted with my engineer. Poor fellow! he is now dead, peace to his ashes! I shall never forget his saying, "You think that I know nothing about mining, because I was not born with a pick in my mouth; but I know more about it than you and your agents and miners all away together." We thought differently, and as I had to pay the piper I thought I had a right to choose the tune. From that day to the day the level was completed we never had an engineer about the place but three times, owing to accidents to the machinery. The blacksmith—John Calvert by name—has attended to the machinery, done all the sharpening, and "fettled" up the borers for seven years; and let me add here, to the credit of the men, that we have only changed hands three times since the commencement. Joseph Cottingham and Co., six in partnership, worked for the first three years, when Joseph's health broke down, and his brother Anty was frightened out of the place, after being hurt by an explosion. George Waggett and Co. also stuck to it for about the same time. The third and last lot—Harker and Co.—with Joseph Cottingham again as first machine-man stuck to it till the finish.

But to resume my story. Our men were necessarily all new to the work. The first machines were far from being perfect, and were constantly getting out of order. The sundry expenses gradually accumulated, the price per fathom went up to 8d. (that is to the men without any extras), and continued at that price for many months. I began to look very blue, and my agent, now also dead, poor fellow, quite lost heart; but I kept up steadily. I had not gone into the thing to make money out of it, and a man must pay for his experience in boring as in everything else.

It is the opinion of all the men employed, and of the agents, that it would not have been possible for several hundred fathoms to have moved the forehead at a less price than from 12d. to 14d. a fathom by hand labour. Verily, I had hold of an uncommon hard bargain. Without rising to the surface for ventilation every 70 or 80 fms. the level could not have been carried on. This would have entailed seven or eight rises, costing nearly as much as the level itself, which must have been stopped during the time the rises were being made. This is tantamount to saying it would never have been driven at all. It would have killed half the men, and it would have sickened the company completely, and ultimately have been abandoned. From this fate we were saved by the compressor.

We very soon gave up using gunpowder, and took to gun cotton, which did very well until several accidents, fortunately not fatal, testified to its extreme danger, and frightened the men out of using it. We then with some difficulty got them to try dynamite, and with such excellent results that now there is not a man upon the field who has ever tried it who will use anything else. Rather pay, they say, 2s. a pound for dynamite than have powder given. It is, in truth, a marvellous compound, and the facility of using it in all situations, wet or dry, truly surprising. In a hole full of water, for instance, the men have been seen to ram down the cartridges with a stick, until the stuff ran out of the hole at the top, looking like pea soup, from the bursting of the cartridges; but they merely put in, as usual, the primer and cap, and off it went down to the bottom of the hole. It never misses. We commenced the use of it in March, 1873. The average cost per lineal fathom for dynamite, caps, and fuse has been about 27s. The regulation height of the level is 6 ft. above the rails, the width 4 feet; therefore, every fathom will have contained 144 cubic feet of stuff, equal to 12 tons. Every ton removed, therefore, will have cost 2s. 3d. in explosive, which in a confined drift will not be considered extravagant. In the leading forehead in the Mont Cenis Tunnel I was informed, it cost 5d. per fathom for dynamite. It must, however, be remembered that for the sake of ease the men have sometimes taken 7, 8, and 10 ft. in height. The largest charge we ever put into a hole was into a 4-ft. hole, 13 2-in. cartridges, or 26 ozs., equal to 5 lbs. 4 ozs. of gunpowder. It would have been manifestly impossible to have got anything like that quantity of powder into any jumper hole. Latterly, owing to the extreme hardness of the rock, and the difficulty of getting in deep holes, we have had to use more dynamite. During the last three months, for instance, we have used as follows: December, for 12 fms., 39 packets, 19½ lbs.; January, for 10 fms., 36 packets, 18½ lbs.; February, for 10 fms., 40 packets, costing 20d. This was the heaviest amount we have ever had. The ventilation has been throughout good, but after firing a number of holes the men generally leave. A few days since there were 12 people all up at one time, each with a candle burning, and a horse 748 fms. from the entrance, and the air was as sweet and pleasant as could be.

Let us now turn to the borers. I have seen it stated that no borer has yet been made that would stand for 100 fms. I have had, as before stated, six during the seven years, two have been thrown away, four are still in use, and, although naturally much the worse for wear, they are still in fair workable order, and look as if they would still last for a considerable time. They have been in use four years and a-half. Two of them have been once sent into dock, the other two have never been in any other hands than those of the aforesaid blacksmith and the men, and whenever new pieces were required from Glasgow, or trifling repairs wanted, the blacksmith was able to put them in, and to make the necessary repairs. We have driven over 550 fms. during the time; each borer has, therefore, averaged nearly 100 fms., which I think speaks pretty well for the durability of Messrs. McKean and Co.'s drills. A few days ago some strangers came to see the drill at work, and it bored a hole for them in an excessively hard rock 2 ft. deep, in 5½ minutes, which was not bad work for such an old stager, bearing in mind that the machines I have are not nearly as good as those now manufactured by McKean and Co.

The following are the most salient particulars of the enterprise. We had at first eight men, afterwards six, then four, then six again, and for the last 13 months seven men. We have never had more than two boring-shifts during the 24 hours, but generally only one. Never any night-shifts. The greatest speed we ever attained was in 1876, when seven men in 14 weeks drove 50 fms. at 3d. 18s. per fm., and a siding or turn-rail 6 fms. in length into the bargain, at half-price. For this they got a premium of 20d., which they well deserved. The same seven men have during the last 13 months driven 153 fms., besides making two turn-rails. During the year the price has been at 78s., 80s., 85s., 130s., 110s., and for the last three months at 125s. per fathom, and after deducting the stoppages, which have amounted from 26d. to 29d. a month, the men will have earned about 25s. a week clear per man. The highest price ever paid to the men was 8d. per fathom, the lowest 3d. 18s.; the average price for the entire distance rather under 5d. 10s. per fathom. In this price dynamite, caps, fuse, candles, and drawing the stuff to bank are included; the drawing alone costing the men 10s. per fathom.

All and every sundry charge over and above the men's wages, and falling upon the contractor, when added together, amount on the average to 1s. per fathom; that is to say, walling and arching where required, repairs of compressor and borers, leather, oil, steel, carriage of materials, extra wages to blacksmith, and occasional help outside. The actual cost to the contractor thus amounted to 6d. 10s. per fathom, and has left a profit of 2d. per fathom to cover the interest of the capital outlay of 1321. 10s., and the deficiency through wear and tear in the value of the plant as it now stands; the interest, in round numbers, amounting to 400d., and the deterioration in value of the plant to about 600d. If I were to sell the plant at the above valuation now I should be just about square, and have neither won nor lost a five pound note during the seven years, which, if not satisfactory in a pecuniary point of view, is certainly rather remarkable. I knew that I had a hard bargain, but did not go into it for the purpose of making money, the ultimate interests of myself and co-lessees, the interest of the lessees, and the welfare of the population were all bound up in its success. It has succeeded, and I rejoice at having proved to the mining world that not only could it be done in less time but also for less money than in the old-fashioned way.

It is a singular fact, that scarcely a dozen of my mining neighbours have ever been to see the machines at work, and still fewer outsiders. Hundreds will give their attention, and still more their money, to all sorts of bubble schemes, such as the Lisbon Tramways, over which they have no control whatever, and will not look at a bona fide speculation at home, where they can see for themselves that their money if not successfully is at least honestly spent. There

are one or two other interesting facts which I may as well mention. No loss of power by friction of the air against the pipes is perceptible at 750 fms. from the level mouth, and I am told that in the St. Gothard Tunnel the loss is only 10 per cent. in seven miles. With a good air compressor, we could certainly go ten miles without being compelled to make a single hole for air. It has taken us on an average 90 ft. of holes bored to cut a fathom of ground, 560 fms. will have, therefore, required 50,400 ft. of holes. The total cost for the repairs of the borers and of the compressor (the breakages in the compressor being by far the heaviest items) amounted to 185d., and the depreciation in the value of the borers being estimated at 400d., it follows that the actual cost of boring 50,400 ft. of holes has amounted to 585d. That is to say, 3d. for every foot of hole. We compare this with the published accounts of the cost only of the repairs of borers in the St. Gothard Tunnel, we shall find that they amounted to two francs per metre of holes for the Ferroux machines, and four francs per metre of holes for the repairs of the Dubois Frères machines. What the cost of the machines themselves was we have no means of judging, as they do not tell us. Upon the whole, &c., to show the same amount of work done for the same money.

"Si quis novit rectius istis, candidus impertit,  
Si non utere mecum."

Which being literally interpreted for those among my mining readers not well up in their Latin, means—"If you know any better way of doing these things, kindly tell me how? If not, use my tools."

It will no doubt be asked, what is to be the result of this expenditure? The answer is, time only will show that; but the veins have been laid open to a depth of from 36 to 50 fms. below the old workings; access and drainage have been secured. The veins have still to be tried, which will of course require a further outlay. But driving in veins is, as every miner knows, a far less costly as well as a more rapid process than cross-cutting in hard rocks, and your money will be all the while gradually coming back. Friarfold vein is one of the great east and west veins of this royalty and district. We cut it on March 12, and it took us six days to reach the north cheek, it was so extremely tough. Its appearance I rejoice to say has filled every miner about the place with delightful hopes. With two bad or mucky sides of grit and plate, it is nevertheless throughout its entire width of over 6 ft. filled with good large blobs of ore on both sides, indicative of a first-class mine in the lime beds, both above and below.

The vein extends in an east and west direction for at least 15 miles. It has in connection with the other veins of the royalty produced from the upper strata during my time upwards of a million and a half of money. Surely if ever there was a good mining speculation this must be one. "Fortune favours the brave." The Old Gang Mining Company have pluckily borne four-fifths of the cost of making this long and expensive trial. They richly deserve to reap the fruits of it in the 1500 fms. of length of veins laid open in their ground. The A.D. Mining Company (Limited) have come off with only paying the remaining one-fifth. They have as much ground as the Old Gang, and may have twice as much if they choose, and have only the pluck to find the capital to work it.

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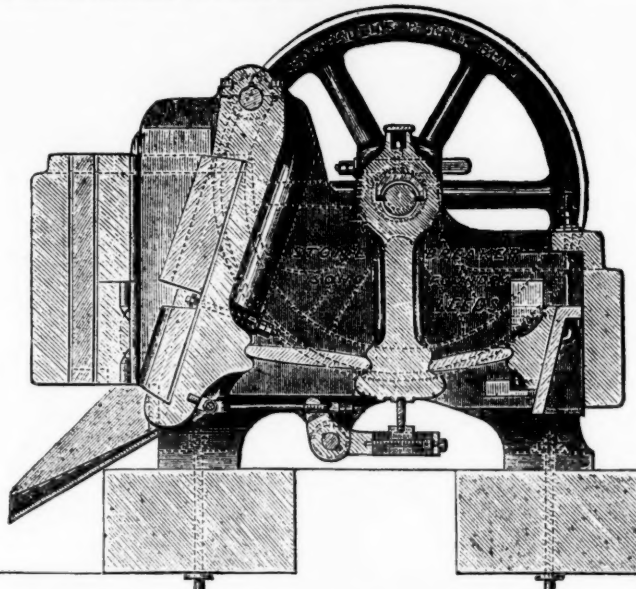
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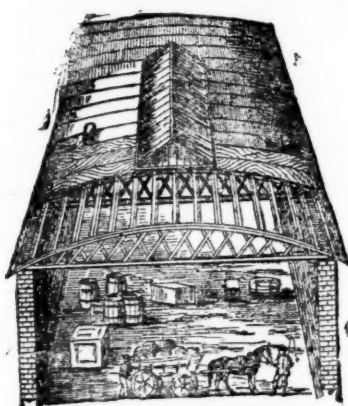
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